0. 2.

IWM CONSULTING GROUP

7428 Rockville Road, Indianapolis, IN 46214

July 13, 2007

Mr. Juan Thomas
United States Environmental Protection Agency Region 5
RCRA Enforcement and Compliance Assurance Branch, DE-9J
77 West Jackson Boulevard
Chicago, IL 60604

Re: Supplemental Site Assessment Work Plan
Former Amphenol Facility #IND 044 587 848
980 B Hurricane Road
Franklin, Indiana

Dear Mr. Thomas:

Industrial Waste Management Consulting Group, LLC (IWM Consulting), on behalf of Amphenol Corporation, is submitting this Supplemental Site Assessment Work Plan to the United States Environmental Protection Agency (US EPA) Region 5, RCRA Enforcement and Compliance Assurance Branch in response to the EPA letter dated June 6, 2007.

If you have any questions regarding this proposed Supplemental Site Assessment Work Plan, please do not hesitate to contact the undersigned at (317) 347-1111.

Sincerely,

IWM CONSULTING GROUP, LLC

for

Bradley E. Gentry, LPG
Senior Project Manager

cc: Mr. Gary Cygan, US EPA Region 5
Mr. George Hamper, US EPA Region 5
Mr. Sam Waldo, Amphenol Corporation
File

IWM CONSULTING GROUP
7428 ROCKVILLE ROAD, INDIANAPOLIS, IN 46214

SUPPLEMENTAL SITE ASSESSMENT WORK PLAN

Former Amphenol Facility
980B Hurricane Road
Franklin, Indiana

INTRODUCTION

Industrial Waste Management Consulting Group, LLC (IWM Consulting) has developed this Supplemental Site Assessment Work Plan (Work Plan) in response to the Environmental Protection Agency (EPA) letter dated June 6, 2007. Specifically, the EPA has requested that the deeper geologic horizons beneath the Former Amphenol Facility (Site) be more fully characterized in order to determine the groundwater quality and flow characteristics and to evaluate the possibility of the hydraulically up gradient municipal well field (Webb Well Field) being adversely affected by the contaminants historically released at the Site.

The objective of this Work Plan is as follows:

1. Obtain data from existing monitoring and production wells to determine if dissolved volatile organic compounds (VOCs) present onsite have the potential to migrate offsite onto the Webb Well Field property;

2. Evaluate the newly obtained information and determine if additional offsite characterization activities are warranted; and

3. If warranted, obtain subsurface soil and groundwater samples in order to initially characterize geologic and hydrogeologic conditions between the Site and the Webb Well Field.

In general, the objectives above will be achieved through the completion of two major phases of work. The following sections summarize Site specific geologic and hydrogeologic information known to date and outline the proposed work activities which will be completed under each phase in order to satisfy the objectives outlined above.

SITE GEOLOGY

The Site geology can be described as four distinct units (A, B, C, and D). Unit A is approximately 3 to 8 feet thick and is comprised primarily of yellow brown silty loam. This is underlain with an upper sand unit (Unit B) of stratified fine to coarse sand and sandy gravel. The thickness of Unit B varies across the Site. At MW-20, along the north end of the Site, Unit B is approximately 14 feet thick. Unit B thins to the south to a thickness of about 5 feet at MW-32. Unit B is underlain with a dense, gray glacial till of loam texture (Unit C). At IT-1A, MW-23 and MW-25, Unit C is ranges in thickness between 23 feet to 28 feet thick. Unit C is underlain by medium to coarse sand and loamy sands with thicknesses ranging between 10 feet and 20 feet (Unit D).

Information obtained during the installation of monitoring well MW-13 (permanently abandoned in 1985) indicate unconsolidated deposits are present beneath the Site to a depth of approximately 179 feet below land surface (BLS). A hard silty clay/clayey silt unit is present beneath Unit D and is approximately 62 feet thick. A thin silty gravel seam (2.5 feet thick) is present near the base of the silty clay/clayey silt unit (approximately 8 feet above the base). A dense silty sand unit underlies the silty clay/clayey silt unit and has a thickness of 15 feet. A hard sandy silty clay unit underlies the dense silty sand unit and has a thickness of approximately 35 feet. A dense sand unit underlies this sandy silty clay unit, is approximately 7 feet thick, and the dense sand unit is underlain by a weathered shale bedrock unit (Devonian-Mississippian Age New Albany Shale Unit).

SITE HYDROGEOLOGY

Unit B is the water-bearing unit considered to be impacted by activities at the former Amphenol facility. Groundwater within Unit B at the Site flows to the south and the depth to water has ranged from 6.07 to 17.91 feet BLS. Thus the saturated thickness of this zone can vary from between 10 and 15 feet during periods of high groundwater conditions to between 5 and 7 feet during low groundwater conditions. Short term mini-pumping tests conducted at MW-12 and MW-24 indicated hydraulic conductivities of 320 gpd/ft^2 and 1860 gpd/ft^2. Hydraulic conductivities calculated from pump tests for MW-31, MW-33, and MW-34 ranged from 169 to 648 gpd/ft^2, which is consistent with silty sand.

Several groundwater gauging events have historically been completed at the Site for wells installed in Unit D. The potentiometric water elevations indicate that the groundwater within unit D flows in a southerly direction.

QUALITY ASSURANCE PROCEDURES

IWM Consulting personnel will generally follow (allowing for variations in newer sampling and analysis techniques) the previously established Quality Assurance Project Plan (QAPP) prepared for the site in 1991. IWM Consulting personnel will take all precautions prior to and during field activities to ensure that the field instruments utilized during this assessment are accurate and to minimize the possibility of cross contamination. Field equipment will be calibrated in accordance with the manufacturer's recommendations and the field calibration procedures will be documented in the project field log book. IWM Consulting also will utilize dedicated sampling equipment whenever possible when obtaining soil and groundwater samples. If dedicated sampling equipment for each sample is not possible, the sampling equipment will be thoroughly decontaminated between sampling events.

The soil and groundwater samples obtained during this assessment project will be properly containerized, labeled, preserved, and transported to a certified laboratory under strict chain-of-custody procedures. The soil and groundwater samples will be analyzed using Level II Quality Assurance/Quality Control (QA/QC) procedures.

IWM Consulting personnel will adhere to the following guidelines when obtaining field QA/QC samples:

Sample Type	Media Type	Analyses	Frequency
Trip Blank	Soil & Groundwater	USEPA SW 846 Method 8260B	1 groundwater sample per sample shipping container
Duplicate	Soil & Groundwater	USEPA SW 846 Method 8260B	1 per 10 samples of each media
Matrix Spike	Soil & Groundwater	USEPA SW 846 Method 8260B	1 per 10 samples of each media
Matrix Spike Duplicate	Soil & Groundwater	USEPA SW 846 Method 8260B	1 per 10 samples of each media

Phase I – Evaluate Data from Existing Monitoring and Production Wells

Conduct Record Review of Subject Area

Representatives from the Amphenol Corporation and/or IWM Consulting will contact the Indiana-American Water Company (INAWC) in order to obtain site access and records pertaining to the production wells located at the Webb Well field. Upon receipt, IWM Consulting personnel will review the available historical data pertaining to the production wells owned and operated by the INAWC. Information to be reviewed includes well construction information, aquifer testing information, historical groundwater analytical results (specifically volatile organic compound analysis), historical and current pumping rates, ground surface elevations, and aquifer elevations.

IWM Consulting personnel will attempt to field locate historical monitoring well IT-5, which was installed on the INAWC property in 1985. Monitoring well IT-5 was installed by Amphenol's environmental subcontractor as part of the historical site assessment activities. If well IT-5 is located, it will be included as part of the proposed groundwater gauging and sampling activities described in more detail in subsequent sections of this Work Plan.

IWM Consulting will review readily available information pertaining to current and historical uses of properties in the immediate vicinity of the Site and the INAWC production well field in order to determine if other operations in the area have the potential to contaminate the INAWC production well field.

Evaluate Static Water Level Elevations for Existing Monitoring Wells

IWM Consulting personnel will initiate a bi-weekly groundwater gauging program for the existing nested monitoring well networks (MW-12 & MW-25, MW-22 & MW-23, and MW-24 & IT-1A). A nested monitoring well network consists of two wells located immediately adjacent to each other with varying construction depths. One well has a screened interval completed in the Unit B geologic unit and one well has a screened interval completed in the Unit D geologic unit. Monitoring wells MW-12, MW-22, and MW-24 are completed in Unit B and monitoring wells MW-23, MW-25, and IT-1A are completed in Unit D. The groundwater elevation information obtained during the gauging events will be summarized in table format, identifying the difference in static head elevation of the two different water bearing geologic units and the site specific vertical hydraulic gradient. IWM Consulting personnel will develop potentiometric groundwater elevation maps for the wells screened across the Unit D geologic unit in order to determine the site specific horizontal hydraulic gradient.

Develop Existing Monitoring Wells Completed in Unit D

The monitoring wells completed in Unit D were installed in 1985 (IT-1A) and 1992 (MW-23 & MW-25) and have not been groundwater sampled since 1993 and monitoring well MW-24 has not been sampled since 1996. Therefore, IWM Consulting proposes to properly develop the monitoring wells through surging and purging techniques and anticipate removing between five (5) and ten (10) total well volumes during the well development activities. The well development activities will be completed by a licensed well drilling company. The purge water will be containerized onsite in an appropriate holding tank and the sediment will be allowed to settle to the bottom of the holding tank. The purge water will then be transferred to the existing remediation system for onsite treatment. The treated purge water will be discharged into the onsite sanitary sewer system per the approved POTW permit.

Collection of Groundwater Samples for VOC Analysis

Approximately 1 week after the monitoring wells have been developed, IWM Consulting personnel will obtain groundwater samples via low flow sampling techniques from the existing nested monitoring well network. The groundwater samples will be submitted for laboratory analysis of VOCs using USEPA SW 846 Method 8260B. Prior to sampling the monitoring wells, depth to groundwater measurements will be obtained and a minimum of 3 well volumes of water will be purged from each monitoring well using a bladder pump equipped with a dedicated sampling apparatus and attached to a flow through cell. The groundwater samples will then be collected from the monitoring wells using dedicated, poly tubing and transferred into the appropriate laboratory provided container. The monitoring wells to be sampled are summarized below:

Well ID	Geologic Unit
IT-1A	Unit D
MW-12	Unit B
MW-22	Unit B
MW-23	Unit D
MW-24	Unit B
MW-25	Unit D

If permission is granted from the INAWC, IWM Consulting personnel will also obtain raw (directly from the production well) groundwater samples from the three production wells (Webb Well No. 2, Webb Well No. 3, and Webb Well No. 5) located on the INAWC property. The raw groundwater samples will be submitted for laboratory analysis of VOC's using USEPA SW 846 Method 8260B. The sampling method utilized during these sampling activities will be dependent on the construction (presence of sampling ports) and operational status of the production wells.

Obtain Groundwater Geochemistry Information

Hydrogeologic conditions observed at the site to date indicate there are at least two groundwater bearing geologic units present beneath the Site. The first one is within a sand and gravel unit that has been identified in previous investigations as Unit B. Unit B extends to a depth of approximately 20 feet BLS and is separated from the second groundwater bearing geologic unit by a confining layer composed of silty clay and clay, identified as Unit C. Unit C extends to a depth of approximately 48 feet BLS. The lower groundwater bearing geologic unit is composed of sand and gravel, extends to a depth of approximately 67 feet BLS, and has been identified as Unit D in previous investigations. Based on historic groundwater elevation data, hydraulic head differences between Unit B and Unit D suggest the groundwater bearing geologic units are not hydraulically connected on Site.

The INAWC Webb Well field is located approximately 3,500 feet northeast (hydraulically up gradient) of the Site with production wells completed in deeper (approximately 80-100 feet BLS) glacial sand and gravel deposits. Available geologic information suggests sand and gravel units in this area are not necessarily contiguous. Groundwater geochemistry characterization may provide important data for determining the hydrogeologic relationship between the aquifer in which the INAWC production wells are completed and the groundwater bearing geologic units identified beneath the Site. The proposed geochemistry parameters for sampling include:

Analytical Parameter	Analytical Method
Sodium, dissolved	USEPA Method 200.7/6010A
Calcium, dissolved	USEPA Method 200.7/6010A
Magnesium, dissolved	USEPA Method 200.7/6010A
Potassium, dissolved	USEPA Method 258.1/7610
Sulfate	USEPA Method 375.3/9036
Chloride	USEPA Method 325.2/9251
Total dissolved solids	USEPA Method 160.1
Total Organic Carbon	USEPA Method 415.2
Alkalinity, total	USEPA Method 310.1
Alkalinity, as Bicarbonate	USEPA Method 310.1
Alkalinity, as Carbonate	USEPA Method 310.1
Iron, dissolved	USEPA Method 200.7/6010A
Manganese, dissolved	USEPA Method 200.7/6010A
Nitrate	USEPA Method 353.1

The data will be presented in Stiff and Piper Diagrams (Trilinear Diagrams) for interpretation. IWM Consulting personnel will also obtain field readings for dissolved oxygen, oxidation-reduction potential, specific conductivity, & pH.

IWM Consulting proposes to obtain geochemistry groundwater samples from the following monitoring and production wells:

Well ID	Geologic Unit
IT-1A	Unit D
MW-12	Unit B
MW-22	Unit B
MW-23	Unit D
MW-24	Unit B
MW-25	Unit D
Webb Well Field #2	Not applicable
Webb Well Field #3	Not applicable
Webb Well Field #5	Not applicable

Initial Data Evaluation

A brief letter report, which will include the appropriate figures and tables, will be generated for the Site and summarize the results of the Phase I investigation activities. The newly obtained data should clarify whether or not the existing monitoring wells completed in Unit D have the presence of dissolved VOCs, are completed at depths consistent with the deeper geologic strata as the offsite production wells, and whether or not a hydrogeologic relationship exists between the aquifer in which the INAWC production wells are completed and the groundwater bearing geologic units (Unit B and Unit D) identified beneath the Site. IWM Consulting will use this data to evaluate the feasibility of the VOCs present beneath the Site having an adverse effect on the Webb Well Field production wells.

Once these determinations have been made, IWM Consulting will make recommendations as to whether or not the installation of additional monitoring wells between the Site and the Webb Well Field are warranted.

Phase II Supplemental Site Characterization Activities

If the results of Phase I activities suggest that additional deep monitoring wells must be installed, IWM Consulting will oversee the installation and development of three deep, offsite groundwater monitoring wells. The location of these monitoring wells will be determined in consultation with U.S. EPA. The monitoring wells will be installed in a manner that will allow for a determination of the horizontal hydraulic gradient to be calculated. The monitoring wells will be 2-inches in diameter and screened in the appropriate geologic strata from which the two INAWC wells (Webb Well No. 2 and Webb Well No. 3) located on the west side of Hurricane Creek are screened. The soil lithology encountered during installation activities will be described on a continuous basis in accordance with the United States Department of Agriculture (USDA) guidelines and vertical aquifer VOC profiling will be achieved through periodic analysis of soil and groundwater samples. IWM Consulting personnel anticipate obtaining confirmatory soil and groundwater samples every 20 feet during installation activities (or at the top and bottom of each water bearing unit if the total thickness is between 10 and 20 feet) and the samples will be submitted for laboratory analysis of VOC's using USEPA SW 846 Method 8260B. The confirmatory soil samples will be obtained in accordance with EPA's Method SW846-5035A or Indiana's method IN-5035M. IWM Consulting personnel may also obtain select soil samples for particle size analysis (sieve and hydrometer) using method ASTM D 422 and loss of ignition (organic content) using method ASTM D 2974.

IWM Consulting anticipates installing the monitoring wells with a sonic drilling rig. The deep monitoring wells will be double cased (6 to 8-inches in diameter) to a depth of approximately 3-5 feet into the top of Unit C (if present). The deep monitoring wells will consist of approximately 5 feet of 0.010 slot, 2-inch diameter schedule 40 polyvinyl chloride (PVC) screen. The total length of associated PVC casing will be dependent upon the total depth of the well. A washed, quartz sand will extend from the bottom of the screen interval to approximately 2 feet above the top of the screen interval. A bentonite seal and then a bentonite slurry mixture will be installed above the sand and extend to the ground surface. The monitoring well casings will extend approximately 3 feet above grade and be completed with a stainless steel stick-up protective casing centered in a cement pad.

Discrete groundwater samples will be obtained from the well boring during installation activities utilizing a submersible pump, an inflatable packer, a k-packer, and a stainless steel screen. The total number of groundwater samples will be dependent on the total depth of the well boring and the number and thickness of the geologic units that yield groundwater. IWM Consulting anticipates initiating the discrete groundwater sampling procedures once the Unit C geologic unit (if present) is encountered. Based on preliminary information obtained for the Webb Well Field production wells, IWM Consulting anticipates the monitoring wells will be completed at depths less than 95 feet BLS.

The newly installed monitoring wells will be developed by the well drilling company as part of the well installation activities. The purge water will be containerized in an appropriate holding tank and then transferred to the existing remediation system for onsite treatment. The treated purge water will be discharged into the onsite sanitary sewer system per the approved POTW permit.

Groundwater Sampling Activities – New Monitoring Wells

Approximately 1 week after the installation and development activities are completed for the new monitoring wells, IWM Consulting personnel will obtain groundwater samples for VOC and geochemistry characterization. The groundwater samples will be obtained in a manner consistent with the procedures outlined in the Phase I portion of this Work Plan and the groundwater samples will submitted for analysis of the same analytical parameters.

Professional Survey

IWM Consulting personnel will contract a professional surveying company to survey the top of casing (TOC) and ground surface elevations for the existing Unit D wells and the newly installed deeper wells. If possible, the TOC and ground surface elevations will also be obtained for the INAWC production wells in order to assist in constructing geologic cross-sections for the subject area.

Final Data Evaluation and Reporting

IWM Consulting will be able to determine the following at the conclusion of the Phase II portion of this Work Plan:

- Determination of existing groundwater conditions (groundwater quality and hydraulic gradient) for wells completed between the Site and the Webb Well Field;
- Determination if the water bearing geologic units (Unit B, Unit D, offsite production wells, and the newly installed wells) have geochemical characteristics similar in nature and if they are in direct hydraulic communication with each other;
- Development of more detailed geologic cross-sections for the Site and surrounding area; and
- Determination if the VOCs detected at the Site are adversely affecting the Webb Well Field production wells.

IWM Consulting will summarize the results of this assessment project in report format and will include all of the necessary attachments (tables, figures, boring logs/well construction diagrams, cross-section maps, and laboratory reports). Additional tasks may be necessary during the implementation of this assessment project, including but not limited to, aquifer testing or groundwater fate and transport modeling.

PROJECTED TIMELINE & CONCLUSION

IWM Consulting anticipates the following timeline when implementing this Supplemental Assessment Work Plan.

Task	Estimated Start Date	Estimated Completion Date	Comments
Phase I	July 16, 2007	September 17, 2007	
Phase II	October 15, 2007	December 17, 2007	Task initiation is dependent upon review of all data obtained during Phase I of this Work Plan.

If you have any questions regarding this proposed Supplemental Site Assessment Work Plan, please do not hesitate to contact the undersigned at 317-347-1111.

Sincerely,

IWM CONSULTING GROUP, LLC

Robert T. Duncan

Robert T. Duncan, LPG
Senior Project Manager

Bradley E. Gentry

Bradley E. Gentry, LPG
Senior Project Manager

Amphenol

Amphenol Corporation

World Headquarters
358 Hall Avenue
P.O. Box 5030
Wallingford, CT 06492
Telephone (203) 265-8900

June 18, 2007

Mr. Juan Thomas
RCRA Corrective Action Project Manager
USEPA (DE9J)
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: Corrective Measures Implementation – Additional Work
Former Franklin Power Products/Amphenol Facility
Franklin, IN (IND 044587848)

Dear Mr. Thomas:

Your letter of June 6, 2007, requesting that additional work be performed at the former Amphenol facility (the Site) in Franklin, IN, was received on June 13, 2007. As noted in your letter, the request for additional work was precipitated by a letter dated May 10, 2007 sent to Amphenol by Tara K. Callahan, an attorney representing the Indiana American Water Company (INAWC). In a June 7, 2007 response to Ms. Callahan, which included USEPA as a copy holder, Amphenol advised Ms. Callahan that we disputed the conclusions made in her letter and that we declined to initiate any actions addressing those allegations.

Our compliance with USEPA's request should not be construed as an acknowledgement of the validity of any claims made by INAWC with respect to responsibility for any alleged contamination of INAWC's Webb Well Field.

Amphenol's consultants are reviewing existing data and the tasks identified in your letter to develop a work plan that will not only allow us and you to draw conclusions regarding ground water flow characteristics but also to provide definitive information on contaminant transport mechanisms (e.g., aquifer transmissivity, hydraulic gradients and vertical hydraulic potentials). With that in mind, we respectfully request that USEPA provide us with copies of any additional hydrogeologic data, including well logs, aquifer performance tests, supply well production records and geochemical sampling results specific to the INAWC well field, that it may have.

As USEPA acknowledged during our telephone conversation in late May, the 1997 INAWC/WHPA modeling report was developed using a number of assumptions without providing empirical data that might support the validity of the results of the modeling effort. Ms. Callahan's letter did little to provide further elucidation. If your agency (or IDEM) does not currently have the requested supplemental information, we respectfully request that USEPA direct INAWC to produce it.

I expect to be able to provide you with a verbal update of our plans by June 22nd. If you have any questions in the interim, please contact me.

Best regards,

Samuel S. Waldo
Director, EHS and Support Services
Amphenol Corporation

cc: J. Nee – Remy International
B. Gentry – IWM Consulting Group
D. Griffin – IDEM
IDEM – Corrective Active Section
IDEM- Hazardous Waste Permitting Section

INTERNATIONAL
TECHNOLOGY
CORPORATION

October 1988

RCRA Facility Investigation Work Plan & Quality Assurance Plan

Presented To:

Amphenol Corporation
Franklin, Indiana

RESPONSIVE TO THE NEEDS OF ENVIRONMENTAL MANAGEMENT

RCRA FACILITY INVESTIGATION
WORK PLAN AND QUALITY ASSURANCE PLAN
AMPHENOL CORPORATION
FRANKLIN, INDIANA

PREPARED FOR:

AMPHENOL CORPORATION
WALLINGFORD, CONNECTICUT

PREPARED BY:

IT CORPORATION

PROJECT NO. 303498
OCTOBER 1988

LPL Investment Group Inc. (203) 265-8600

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 20, 1988

RECEIVED
OCT 24 1988
OFFICE OF RCRA
Waste Management Division
U.S. EPA, REGION V

Mr. William Buller
Project Manager
Waste Management Division (5HR-12)
USEPA Region V
230 S. Dearborn Street
Chicago, IL 60604

RE: RCRA Facility Investigation (RFI) Work Plan
Amphenol Corporation
Franklin, IN
IND044587848

Dear Mr. Buller:

Enclosed please find two copies of the revised RFI Work Plan for the subject facility. The revisions address the comments included in your July 7, 1988 letter as well as subsequent correspondence and communications with Amphenol's consultant, IT Corporation.

By certified copy of this letter I am also sending two copies of the Work Plan to IDEM for review.

As indicated in Table 19 of the Work Plan, we are ready to proceed within two weeks of EPA's approval of the Plan.

Please don't hesitate to contact me if you have any questions.

Sincerely,

Samuel S. Waldo

Samuel S. Waldo
Director,
Environmental Affairs

enclosure

cc: C. McKinley
T. Russell - IDEM
M. Herdrich - IDEM

PO Box 384
358 Hall Avenue, Wallingford, CT 06492

CERTIFICATION PAGE

PROJECT TITLE: RCRA FACILITY INVESTIGATION, FRANKLIN, INDIANA

PREPARED BY: IT CORPORATION

DATE: October 21, 1988

Approved: _______________ 10/21/88
Brian Borofka — DATE
Project Director
IT Corporation

Approved: Susan Tituskin 10/21/88
Susan Tituskin — DATE
Project Manager
IT Corporation

Approved: G SHAMITKO 10/21/88
Gregory Shamitko — DATE
Quality Assurance Officer
IT Corporation

Approved: Steve Illes, Jr. 10/21/88
Steve Illes, Jr. — DATE
Health & Safety Officer
IT Corporation

PREFACE

This document is a revised version of the original RCRA Facility Investigation Work Plan & Quality Assurance Plan. The original plan was submitted to the U.S. EPA on April 11, 1988. In July, 1988, the U.S. EPA had completed a review of the original document, and forwarded to Amphenol a series of review comments. In August, 1988, Amphenol forwarded to U.S. EPA a document titled "Review Comments and Response: RCRA Facility Investigation Work Plan & Quality Assurance Plan".

During the months of August and September, several telephone conversations between Amphenol and the U.S. EPA were conducted. The result of those conversations is this revision of the original document.

To assist the reader in determining where the revisions were made, a list of the pages containing revisions follows this page, and the actual revisions on the individual pages have been underlined.

PAGES CONTAINING REVISIONS

PAGE	DESCRIPTION OF CHANGE
Title	Date change
Preface	Add title
Certification	Date and personnel changes
Table of Contents (ii)	Additional headings
Table of Contents (iii)	Additional heading
List of Tables	Added new Table 2 & 13, change title Table 19
List of Figures	Added new Figures 5 and 10
2-4	Additional text
2-5	Additional text
2-6	Additional text
2-7	Additional text
2-14	Additional text
4-2	Additional text and change well names
4-3	Additional text and change well names
4-4	Additional text
4-5	Additional text
4-8	Additional text
4-9	Additional text
4-10	Revised text
4-11	Additional text
4-12	Additional text and revised
4-18	Additional text
4-19	Additional text
5-11	Additional text
5-12	Additional and revised text
5-13	Additional text
5-21	Additional text
5-22	Additional text
7-2	Additional text
7-3	Additional and revised text

PAGES CONTAINING REVISIONS (CONTINUED)

PAGE	DESCRIPTION OF CHANGE
Table 2	New
Table 5	Revised numbers
Table 6	Revised text
Table 7	Revised text
Table 13	New
Table 14	Revised numbers
Table 15	Revised numbers
Table 19	Revised text
Figure 2	Revised Figure
Figure 5	New
Figure 7	Revised
Figure 8	Revised
Figure 9	Revised
Figure 10	New
Figure 12	Revised well numbers and added additional locations

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

The Amphenol Corporation (Amphenol), Franklin, Indiana facility is the subject of an Administrative Consent Order (ACO) to perform RCRA facility investigation activities. This Work Plan/Quality Assurance Plan (Plan) has been prepared in conjunction with and as part of the ACO. The specific activities of the investigation are outlined in this Plan, and include a review of previous investigations and remedial actions, soil vapor surveys, soil borings and monitoring well installations, and sample collections, including surface and subsurface soil, ground water, surface water and sediment samples. Wherever possible, existing data will be utilized in determining the extent and direction of the investigative activities.

The purpose of this investigation is to provide a quantitative assessment of the extent of contamination associated with the suspected release of hazardous materials. The results of this investigation will be used to determine the need for and the extent of any appropriate future activities. The appropriate actions, if required, will be developed after analytical data from this investigation has been evaluated to determine the:

- Nature and extent of contamination
- Potential threat to public health, welfare and the environment

Recommendations for the appropriate action(s) will be included as part of the report concluding this investigation.

2.0 BACKGROUND INFORMATION

The Amphenol facility covers approximately 15 acres of land in the northeastern portion of Franklin, Indiana (Figure 1). Various commercial and industrial facilities are located around the site and a residential area lies immediately south of the site.

Facilities at the plant site known to have contained or stored hazardous materials included:

- An above ground (500 gallon) 1.1,1-trichlorethane (TCA) storage tank and drum storage area along the west-central side of the building.
- A chemical container storage room along the southwest side of the structure.
- An above ground 500-gallon trichloroethylene (TCE) and 1,000-gallon hydrochloric acid storage tanks on the outside of the building within a fenced-in area west of the plating room.
- A 1,000-gallon in-ground cyanide overflow tank west of the plating room.
- Two 1,000-gallon in-ground tanks located west of the building believed to contain lapping compounds or mineral spirits.
- A fenced RCRA storage facility for storage of 55-gallon drums of hazardous wastes, including spent solvents and electroplating sludges while awaiting shipment.

The facility's Resource Conservation and Recovery Act (RCRA) Part A permit lists a variety of wastes once stored at the plant. The maximum amounts stored at any one time included:

CONTAINERS	AMOUNTS (GALLONS)
TCE	2,750
Metal Hydroxide Sludge	2,750
Kerosene	1,375
Oil/Water	1,375
Grease	550
Methyl Ethyl Ketone	550
TCA	550
Spent Plating Bath Solutions	550
Paint Thinner	275
Methanol	275
	11,000 total

TANKS	
Cyanide Solutions	1,000 total

2.1 SITE HISTORY

The building at the site was constructed in 1961 by Dage Electric, Inc. for the manufacture of electrical connectors. In 1963, Bendix Corporation purchased the operation from Dage Electric. Processes conducted at the site included electroplating, machining, assembling, and storing of the manufactured components as well as inventorying the various raw materials and compounds required for production.

The plating room was located in the southwest corner of the facility (Figure 2). The plating room held several rows of plating and rinse tanks used during the electroplating process.

From approximately 1961 through mid-1981, waste acid, cyanide/alkalide, and chromium wastewaters from the plating operations were routed separately through drain channels below the raised floor grating and out into a sanitary manhole which discharged into the Franklin Public Sewer System. In mid-1981, a chemical pretreatment facility for wastewaters was installed southwest of the main building (Figure 2).

Other plant modifications completed prior to 1981 included:

- Installation of a polyvinyl chloride covering over the concrete floor of the plating room.
- Repiping of the plating process tanks in conjunction with the design of the pretreatment system.

Manufacturing operations were discontinued in 1983, and the process plating equipment, site pretreatment facility, and the RCRA storage area were decontaminated.

Between 1984 and 1987, several site investigation programs were undertaken at the site. These programs are discussed in Section 2.2. In conjunction with the investigative programs, several facility closure activities to remediate the site were also undertaken. These activities are discussed in Section 2.3.

In 1983, The Bendix Corporation (including the Franklin, Indiana facility) was acquired by and became a wholly-owned subsidiary of Allied Corporation. As part of the reorganization brought about by that acquisition, the connector operations of The Bendix Corporation were consolidated with Allied Corporation's Amphenol Products Division. The decision to close the Franklin, Indiana facility was made concurrently with that restructuring.

In December 1986, the Amphenol Products Division was incorporated as the Amphenol Corporation and became a wholly-owned subsidiary of Allied Corporation. All assets of the former Amphenol Products Division (including the nonoperational Franklin facility) were transferred to Amphenol Corporation. On June 2, 1987, Amphenol Corporation was sold to and became a wholly-owned subsidiary of LPL Investment Group, Inc.

2.2 PREVIOUS INVESTIGATIONS

In 1984, as part of the preparation of the site for sale, Allied and Bendix undertook a site assessment to determine if plant operations had resulted in any releases to the environment. The assessment was conducted in several phases, which are discussed in the following sections.

2.2.1 1984 Hydrogeologic Investigation

The 1984 Hydrogeologic Investigation (Investigation) was undertaken to determine if the soil or ground water at the site had been impacted by activities at the site. The Investigation involved:

- Installation of five monitoring wells and the collection and analysis of soil and ground water samples in February 1984.
- Installation of an additional 12 monitoring wells and the collection of ground water samples in June 1984.
- Record search of existing data
- Hydraulic conductivity testing

During the Investigation, analytical samples were collected from the soils and ground water at the site. These samples were analyzed for volatile organic compounds (VOCs), acid/base-neutral extractable compounds (A/B/Ns), EP Toxic metals, cyanide, and pesticides/PCBs.

The Investigation concluded that VOCs were present in some of the soils and ground water of the site. The study indicated that the VOCs with the highest concentrations were trichloroethylene (TCE), tetrachloroethylene (PCE) and 1,1,1-trichloroethane (TCA). A/B/Ns and pesticides/PCBs were not detected in any of the samples collected.

A comparison of the data collected during the two sampling episodes (February and June, 1984) however revealed several discrepancies regarding compounds detected and their concentrations, and raised questions concerning the validity and acceptability of the data base (see Section 2.2.3).

2.2.2 Plating Room Investigation

In August 1984, an investigation of the soils in the area of the site plating room was initiated. The objective of the investigation was to characterize the potential contamination present in the soils beneath the plating room and surrounding areas, and recommend remedial measures.

To accomplish this investigation, 32 soil borings were drilled, 27 of which were in the plating room proper. Of the remaining borings, 3 were placed in the virgin cyanide storage room (immediately west of the plating room) and 2 were placed within a fenced area west of the plating room and south of the storage room. Soil samples were collected from the 0.5-to-1.0-foot, 2.5-to-3.0-foot and 4.5-to-5.0-foot intervals. Figure 3 and Table 1 present the sampling locations and analytical results, respectively. <u>The samples were tested for VOCs and cyanide.</u>

The investigation concluded that:

- VOCs (most notably TCE and PCE) and cyanides were present in the soils beneath the plating room.
- The levels of contaminants decreased with depth.

The investigation recommended that, based on a U.S. EPA clarification bulletin (January 1984), an area within the plating room be excavated and the soils properly disposed.

2.2.3 1985 Site Assessment

Due to concerns over the results of the 1984 Hydrogeologic Investigation, Allied's Amphenol Products Division initiated a second study of the site. The 1985 Site Assessment (Assessment) objective was to develop a comprehensive characterization of ground water flow, contaminant transport, and ground water quality. The Assessment was conducted in two phases. The first phase involved:

- Evaluation of the existing site-specific data base collected in 1984
- Conducting hydraulic conductivity tests and sampling of the existing ground water monitoring wells
- Sampling of the storm drain which runs beneath the western and southern edges of the site property
- Sampling and analysis of surface water samples from Hurricane Creek.

<u>The samples were analyzed for VOCs, metals, and cyanide.</u>

The results of the first phase of the Assessment indicated that a majority of the wells installed during the 1984 Investigation were improperly constructed in that:

- The boreholes were allowed to collapse around the well, permitting near-surface contaminated soil to be placed in direct contact with the screen of the wells

- The wells were not sealed in discrete zones, making them unsuitable for use in determining vertical distribution of contaminants

- The wells were screened such that 60 to 95 percent of the screens were located in low-permeablility strata (silty clays) rather than the sand and gravel water bearing strata.

The first phase of the Assessment also concluded that VOCs were present in the ground water with the highest concentrations of VOCs being located in the area south of the plating room. VOCs were also detected in the storm drain and the waters and sediments of Hurricane Creek.

The second phase of the Assessment involved:

- Proper abandonment of several improperly constructed wells and installation of replacement wells.

- Additional investigation of the role of the storm drain in the hydrogeologic conditions at the site

- Further delineation of the extent of the contamination at the site.

During the second phase of the Assessment, three of the 1984 Investigation wells were overdrilled and grouted, and six additional wells were installed. Figure 4 shows the location of the wells. In addition, a series of 27 shallow (6-foot) borings were drilled in the vicinity of the plating room (Figure 5). Samples collected from the soil borings and newly installed wells were analyzed for VOCs only. The results of the second phase of the Assessment indicated:

- VOCs were present in the ground water. The VOCs were limited primarily to TCA, TCE, toluene and dichloroethane (DCA) with the highest concentration detected being 84 parts per billion (ppb) (TCA) (Note: only the 6 newly installed wells were sampled).

- The storm drain at the site functions as a partial ground water intercept

- Outfall from the storm drain contained VOCs.

- The soils in the vicinity of the plating room and wastewater sewer line contained organic contaminants in concentrations similar to that found in site ground water monitoring wells (Table 2).

2.2.4 1986 Ground Water Monitoring

Based on the results of the 1985 assessment, Allied's Amphenol Products Division instituted a quarterly ground water monitoring program at the site. The program was designed to monitor seasonal variations in the quality of the ground water at the site and in the storm drain discharge to Hurricane Creek.

The quarterly monitoring samples were analyzed for VOCs only. The analytical results are provided in Table 3.

2.3 FACILITY CLOSURE ACTIVITIES

As part of the preparation for sale of the property, Allied's Amphenol Products Division undertook several site closure activities. These activities are presented below.

2.3.1 Plating Room

Based on the results of the Plating Room Investigation, Allied's Amphenol Products Division undertook the remediation of the Plating Room area. Figure 6 presents the area of the remedial activities.

During the period of May 8 to June 14, 1985, the following activities were conducted by Chemical Waste Management of Chicago, Illinois.

- Twenty exhaust hoods and associated venting were dismantled, crushed, and properly disposed.
- The PVC floor covering and concrete floor was removed and properly disposed.
- An area of approximately 1100 square feet was excavated to a depth of approximately 7 feet. Soil borings within this area had exhibited concentrations of cyanide equal to or greater than 10 parts per million (ppm).
- The excavation area was treated with a calcium hypochlorite solution to achieve alkaline chlorination of any cyanides remaining.

- The area was backfilled with clean fill which contained crushed limestone to maintain alkaline subsurface conditions.

- The concrete flooring was replaced.

2.3.2 Sanitary Sewer Line

The 1984 Hydrogeologic Investigation indicated that the VOC contaminant plume in the ground water appeared to follow the sanitary sewer line exiting the building area. In July 1984, an inspection of the sewer line between the two manholes located on the site property indicated the line to be in disrepair, with numerous separated joints and broken lengths. To eliminate the line as a potential source of contamination, the line was replaced in May 1985. Prior to replacement of the line, a series of four shallow (approximately 10 feet deep) hand auger borings were conducted to determine the extent of the contaminated soil surrounding the old line. Three of these borings were placed on a line approximately 35 feet east of the old line. Soil samples from these borings revealed no VOC contamination and total cyanide concentrations of less than 0.3 ppm. The fourth boring was placed approximately 17 feet east of the old line and revealed concentrations of TCE at 1.0 ppm and perchloroethylene at 2.0 ppm in the soil.

Replacement of the line involved:

- Excavation to the existing line at each of the manholes on the site property.

- Disconnecting of the sewer line from the manhole and plugging the end of the pipe with concrete.

- Installation of a new pipe, offset 35 feet from the existing pipe, to avoid possibly contaminated soils.

- Backfilling of the excavation area.

2.3.3 Other Activities

As part of the process for discontinuing of the manufacturing operations at the site, the following activities were conducted:

- Wastewater Treatment System

  - Water flushed the 3 underground pipes from the Plating Building to the wastewater treatment equalization sumps.

  - Emptied and treated on-site wastewaters and sludges in the cyanide, acid and chrome sumps.

  - High pressure water washed the 3 sumps.

  - Collected and treated on-site the spent wash water from the sump cleanings.

  - Emptied and treated on-site wastewaters and sludges in the cyanide/chrome reactor tanks, neutralization reactor tank, flocculation reactor tank, 1 clarifier and the 4 reagent tanks.

  - Emptied the filter press and water washed the plates.

  - Emptied the filter press dumpster.

  - Emptied remaining material in the clarifier utilizing a vacuum tanker.

  - Cleaned all tank exterior walls and the wastewater treatment building floor.

- Plating Shop

  - Emptied and treated on-site all electroplating bath solutions and rinses.

  - Cleaned all plating shop tanks.

  - Removed, cleaned and put back all floor grating.

  - Cleaned the PVC floor lining.

  - Cleaned the PVC trench lining.

  - Cleaned the PVC exhaust duct inlets.

  - Labeled all electroplating bath solution tanks to identify previous contents.

  - Cleaned the former virgin cyanide (solid) storage area.

- Container Storage Area

  - Emptied and treated on-site the contents from the 3 concentrate tanks.

- High pressure washed the pad with a 4 percent sodium hypochlorite solution until a free chlorine residual was detected in the spent wash.

- Processed the spent wash water in the site treatment plant.

- High pressure washed the area with water until a pH of 6 - 8 was obtained in the spent wash water.

- Processed the spent wash water in the site treatment plant.

• Underground Cyanide Tank

  - Pumped the cyanide wastes from the tank to the site treatment plant.

  - Poured 5 gallons of 12 percent sodium hypochlorite solution into the inlets of the two pipelines leading to the tank. Positive chlorine residual was measured at the pipe discharges indicating that free cyanide had been destroyed.

  - Flushed the pipelines with water until a pH of 6 - 8 was achieved in the spent wash water.

  - Capped the pipes at the discharge end.

  - Poured 55 gallons of 12 percent sodium hypochlorite into the tank.

  - High pressure washed the tank with 4 percent sodium hypochlorite until a free chlorine residual was detected in the spent wash.

  - Treated the spent wash water in the site treatment plant.

  - High pressure washed the tank with water until a pH of 6 - 8 was achieved in the spent wash water.

  - Pumped the spent wash to the site treatment plant for treating.

• Monitor Well Abandonment

  Monitoring Wells MW-1, MW-2, MW-4, MW-5, MW-6, MW-7, MW-8, MW-10, MW-11, MW-17, IT1B and IT4 (Figure 4) were removed and the boreholes grouted to the ground surface.

• RCRA Closure Plan

  On January 14, 1987, an inspection of the site by the Indiana Department of Environmental Management (IDEM) noted that a Closure Plan for the site had not been submitted for approval. In response to a notification of violation (dated June 25, 1987), Amphenol submitted a Closure Plan to IDEM on August 4, 1987. The Plan is currently under review by IDEM. Initial comments from IDEM indicate that the Plan is in substantial compliance with the regulations.

2.4 PHYSIOGRAPHY AND HYDROGEOLOGY

2.4.1 Physiography and Topography

The site is located in the northeastern edge of Franklin, Indiana approximately 1.6 miles west of I-65 and 0.5 mile north of State Route 44 in Johnson County, Indiana. The site covers approximately 15 acres and is bounded on the east by Hurricane Street, on the south by Hamilton Avenue and on the north by an abandoned Conrail Railroad line.

Businesses in the vicinity of the site include:

- The Farm Bureau Co-Op fertilizer storage facilities located directly west of the site.
- Arvin Automotive, a company involved in the manufacture of various automotive components, located north and northwest of the Conrail Railroad tracks.
- Grimmer Schmidt, a corporation which manufactures air compressors, located on the east side of Hurricane Street.

Residential dwellings are located to the south of the site.

The site is located within the Tipton Till Plain of the Till Plains Section of the Central Lowlands Physiographic Province (Schneider 1966). The Till Plain is characterized as a nearly flat to gently rolling, essentially featureless plain.

The topography of the area is relatively flat with no major elevation changes. Several episodes of continental glaciation which occurred during the Pleistocene Epoch with subsequent weathering and erosion from melt-waters of the glaciers have formed the present land surface.

The site is relatively level, with the ground surface gently sloping away from the main building in both the northwest and southeasterly directions. The ground surface elevation ranges from roughly elevation 735 [Mean Sea Level (MSL)] at the southwest corner of the building to about elevation 731 (MSL) at the northwestern corner of the property. An elevation of about 734 (MSL) is found toward the southeastern corner of the site.

2.4.2 Surface Water Hydrology

The site lies entirely within the Hurricane Creek watershed. The major portion of the site surface drainage flows to the northwest to an unnamed drainage ditch. This ditch becomes channelized as a 72-inch storm drain which discharges to Hurricane Creek, approximately 1200 feet southeast of the site. The remainder of the surface drainage flows to the southeast to Hurricane Creek.

Hurricane Creek flows to the southwest to its confluence with Youngs Creek, about one mile downstream. Table 4 presents available stream flow information for Hurricane Creek. Hurricane Creek drains an area of approximately 15.6 square miles.

2.4.3 Geology

The site lies within the Scottsburg Lowland geologic physiographic unit. The unit is a linear northwest-southeast trending belt following the strike of the upper Devonian (New Albany) and lower Mississipian (Borden) shales (Wayne, 1963). The regional bedrock geology is predominantly the New Albany shale, a black shale containing large quantities of organic matter and minor amounts of dolomite and dolomite quartz sandstone (Shaver, 1970). Structurally, the bedrock dips to the west-southwest toward the center of the Illinois Basin. The unconsolidated deposits in the vicinity the site consist of sands, gravels and silts associated with valley-fill deposition from melt-waters from the receding glaciers. These "valley train" deposits are part of the Atherton Formation of Wisconsinian age.

Just northwest of the site, these soil materials grade into glacial till deposits of the Cartersburg Till Member of the Trafalgar Formation (Wayne, 1966). Glacial tills are characterized by an unsorted, physical heterogeneous material which is typically unstratified. Clay, silt and sand size material make up the major portion of the till. Minor amounts of gravel, cobbles and boulders and sand layers within the till stratum may also be present.

The unconsolidated deposits range from 150 to 200 feet in the thickness in the vicinity of the site (Hill, 1976). The U.S.D.A. Soil Conservation Service (1979) has mapped the area as Ockley loam, which forms on 0 to 2 percent slopes within broad outwash plains and terraces adjacent to bottom lands of rivers and creeks.

Soil borings drilled at the site indicate that the area is underlain by the following deposits, in descending order:

- A relatively thin (5 to 12 feet in thickness) fine-textured-layer consisting of brown silty clay to sandy clay.
- A layer of granular deposits (approximately 5 to 20 feet thick) consisting of brown coarse to fine sand to silty sand grading to gray sandy silt.
- A fine-textured layer, approximately 28 to 30 feet thick, consisting of brown to gray sandy silt to silty clay.

Borings at two locations were advanced through the lower fine textured layer. A second sand layer (approximately 12 feet in thickness) was encountered at each location. The boring at one location was advanced beyond this layer. This boring encountered (in descending order):

- An approximately 55 foot thick layer of silts and clays.
- A 2.5 foot lense of silty gravel.
- A 5 foot thick layer of silts and clays
- An approximately 10 foot thick layer of silty sand.
- An approximately 40 foot thick layer of silts and clay.
- A 7 foot thick layer of sand.

Weathered shale was encountered at approximately 179 feet below ground surface. Figures 7, 8, and 9 present geologic cross-sections of the site.

2.4.4 Hydrogeology

Three aquifers are present in the area of the site. These aquifers are:

- Sand and gravel deposits.
- The middle Devonian Jeffersonville limestone and Geneva dolomite.
- The middle Silurian Niagaran limestone.

The sand and gravel aquifer is the primary aquifer of concern in Johnson County and in the vicinity of the site. Wells completed within this aquifer are generally from 50 to 150 feet in depth and can produce from 100 to in excess of 2,000 gallons per minute (Uhl, 1966). With one exception, all public water supply wells in Johnson County are located within this aquifer. Ground water flow in the vicinity of the site is generally to the south and southeast toward Youngs Creek and Hurricane Creek. Both creeks represent ground water discharge locations (Figure 10).

The sand and gravel aquifer is separated from the limestone/dolomite aquifers by the Borden and New Albany shale formations. The shales are generally considered an aquitard, and in some places, an aquiclude to ground water flow.

Ground water at the site occurs in the near surface sand and gravel deposits. Ground water at the site is under water table conditions (unconfined). Figure 11 presents the ground water contours as recorded on May 3, 1985. The near surface sand and gravel deposits are not utilized for drinking water purposes.

As can be seen in Figure 11, the ground water flow at the site is generally to the south. The ground water flow is influenced by the presence of the 72-inch storm drain located in the southern portion of the site. The storm drain acts as a localized ground water intercept in this area, changing the direction of the ground water flow to the east.

Hydraulic conductivities at the site range from 9.51×10^{-4} (well 3) to 4.97×10^{-6} (well 4). Generally, wells located in the northern portion of the site, (furthest from the storm drain and nearer the contact between the glacial till and valley train deposits) exhibited lower hydraulic conductivity values. Wells located in the southern portion of the site (nearer to the influence of the storm drain and well within the valley-train deposits) generally exhibit higher hydraulic conductivity values.

3.0 PROJECT APPROACH

Section 2.0 presents background information regarding the site. The background information is extensive, covering both the local conditions at the site, and regional conditions near the site. Background information exists for the following areas:

- Physiography and Topography
- Hydrology
- Geology
- Hydrogeology

In addition to the above mentioned fields, an extensive amount of work has been done defining the type and extent of contamination at the site, and in remediating the conditions at the site. This work has involved, among other items:

- Excavation and removal of contaminated soil
- Decontamination of site facilities
- Installation of monitoring wells and collection of soil and ground water samples
- Quarterly monitoring of the ground water at the site.

With the exception of the 1984 Hydrogeologic Investigation analytical results, the data collected to date can be considered quantitative in nature. This is based on the fact that:

- The data was collected in accordance with appropriate U.S. EPA Guidance Documents
- The samples were analyzed in accordance with U.S. EPA methodologies
- QA programs were in effect, and QA results were supplied, for the investigative phases conducted.

In view of these facts, the need for an extensive investigative program does not appear to be warranted. Rather, the need exists for updating the current data base and eliminating the few remaining data gaps. Therefore, a relatively limited scope-of-work is detailed in the following section.

4.0 TECHNICAL WORK PLAN

The following sections detail the scope of work to be conducted at the site. Sampling methodologies and rationale are included within the various sections. The Work Plan has been prepared in accordance with the RCRA Facility Investigation Guidance Document.

4.1 DATA REVIEW

Section 2.0 presents the data that is currently available regarding the site. The data base is fairly extensive and covers both regional and local conditions.

The geologic and hydrogeologic data base appears to be sufficient for the site. This is based on the number of borings and wells installed, the fact that the borings were drilled, soil samples collected, and the soils physical characteristics were determined by appropriate ASTM standards, and the fact that the local and regional data correlate very well. Although some concern existed over the method of construction for several of the original wells at the site, subsequent well installations utilizing RCRA approved construction techniques served to substantiate the information regarding the sites hydrogeologic characteristics.

The analytical data obtained from those wells installed during the 1984 Hydrogeologic Investigation appears to be of only qualitative value. The rationale for this assessment is that, although the samples were analyzed according to U.S. EPA methods, due to the method of well construction, the data may not be representative of the actual conditions at the site.

The analytical data obtained from the 1985 Site Assessment and 1986 Quarterly Monitoring investigation, as well as that obtained from the site facility closure activities can be considered quantitative in nature. The rationale for this assessment is based on the known well construction and sampling methodologies, use of U.S. EPA-approved analytical procedures, the known Quality Assurance (QA) programs in effect during the field investigations and at the analytical laboratories, and the QA data supplied with the analytical results.

However, due to the limited scope of the analytical data available from the 1985 and 1986 investigations, additional sampling and analysis is recommended to resolve the data gaps remaining. Data gaps identified include:

- Current concentrations of VOCs in the ground water at the site and in the surface waters of Hurricane Creek. The latest available information was collected in November, 1986.
- The level of contamination remaining in areas where remedial measures have previously been implemented.
- The integrity of the underground cyanide overflow tank and the lapping compound tanks have not been determined. These tanks have remained empty since 1983, however, due to the nature of the tanks, the possibility of residual contamination around the tanks exists.

To satisfy these data gaps, the following scope of work will be conducted at the site.

4.2 GROUND WATER INVESTIGATION

Due to the fact that the latest available data concerning the quality of the ground water at the site were collected in 1986, additional ground water information is necessary to determine the current conditions at the site. To obtain this information, it is proposed that the following tasks be performed:

- Installation of four shallow (approximately 20 foot) and two deep (approximately 60 foot) ground water monitoring wells.
- Collection of one round of ground water samples for VOC analysis from the newly installed and remaining previously installed wells at the site.

The locations for the proposed new wells are shown in Figure 12. The rationale for the individual locations is as follows:

- MW20 - This well will be placed in a hydraulically upgradient position and will furnish data regarding the quality of the ground water entering the site.
- MW21 - This well is located downgradient of the empty underground tanks and product storage area and will provide information on residual contamination in the soils and if that contamination is entering the ground water.

- MW22 & MW23 - These wells are located in the area of the remediated sanitary sewer line and will provide information on the extent of the VOC plume and any residual contamination from the old sewer line. MW22 will be a shallow well and MW23 will be a deep well.

- MW24 - This well will supply information on the vertical and lateral extent of the VOC plume.

- MW25 - This well will be a deep well to provide information on the vertical extent of the plume.

The proposed monitoring wells will be constructed in accordance with the RCRA Ground Water Monitoring Technical Enforcement Guidance Document (OSWER 9950.1 Sept, 1986). Specific details of the well construction materials and procedures are:

- Well Screen: Two-inch-diameter factory slotted Schedule 40 PVC screen. Slot size shall be 0.010. Screen length shall be 10 feet.

- Well Riser: Two-inch-diameter Schedule 40 PVC.

- Protective Casing: Four-inch steel pipe of sufficient length to be grouted two to three feet into the ground. The casing shall be equipped with a locking cup.

- The well screen and pipe shall be inserted into the hole through HSA, one joint at a time. The end of the screen shall be plugged with a threaded end cap or plug. All joints shall be hand tight. When the well tip has been lowered to the correct depth, sufficient pipe shall remain in the string to provide a 2-1/2 foot "stick-up" above ground surface.

- A removable cap shall be placed over the top of the well riser prior to placing the filter pack and bentonite seal to prevent foreign materials from entering the well.

- The well screen shall be filter packed with clean and washed, bagged silica sand graded accordingly for the well screen slot size, such as Unimin 16-30 or equivalent, shall be used. The sand may be placed by maintaining a head of water in the boring, and using the downward flow of water to prevent bridging. Clear water shall be used.

- One to two feet of the sand filter pack shall be placed at a time, and the augers shall be retrieved a corresponding distance to expose the sand pack to the formation before placing the next lift.

- The sand filter pack shall extend 2 feet above the top of the screen slots to prevent bentonite and cement grout from reaching the screen.

- A minimum 2-foot bentonite pellet seal shall be carefully placed above the sand filter pack. The pellets will be placed in the boring with water at a rate which prevents bridging from occurring. The seal may also be tamped in place using a plugged tremie pipe or other tamping device.

- A cement grout consisting of less than or equal to 7 gallons of water per 94 pound bag (one cubic foot) of portland cement shall be placed above the bentonite seal to extend to the ground surface no sooner than 1/2 hour after wetted bentonite pellets are placed.

- All depths to, and thicknesses of, materials shall be recorded. A weighted measuring tape, or tremie pipe or drill rods of known and accurate length may be used to determine these depths.

- The well shall be cut off so that 2-1/2 feet of well riser extends above the ground surface (the "stick-up"). A removable vented cap shall be placed at the top.

- A vented 4-inch diameter locking steel protective casing will be installed 2 feet into the borehole (cement grout).

- The top of the casing shall be positioned one to three inches above the top of the well riser.

- The well shall be permanently marked with an identification number.

- The well will be developed by bailing or pumping and surging to insure good hydraulic connection with the surrounding formation. <u>Development water from wells placed near existing contaminated wells will be drummed pending analysis of the ground water samples.</u> & dispo

- Upon completion of the well, a sensitivity test shall be run to determine well viability.

Ground water samples will be collected in accordance with <u>RCRA Ground Water Monitoring Technical Enforcement Guidance Document</u>. Specific details of the sampling procedure are:

- Record well number, sample identification number, date, time, sampling personnel and weather conditions on the sample collection log.

- Measure and record the water level in the well.

- Calculate the volume of water in the riser pipe and purge a minimum of five volumes from the well. Purging may be done by pumping or bailing. Bailing will be done with a decontaminated stainless steel bailer. If purging is conducted by pumping, the pump will be thoroughly decontaminated between wells. <u>Purge water from wells exhibiting VOC concentrations greater than 1 ppm (based on the last</u>

quarter 1986 results, and from new wells placed near these existing ones will be drummed pending analysis.

- Collect the sample by means of a stainless steel bailer. The bailer will be decontaminated before use. The first bailer of well water will be discarded. Sample water will be poured directly from the bailer into the appropriate sample bottles (Section 5.3).

- Field parameters of pH, specific conductance and temperature will be determined and recorded on the sample collection log.

- Prepare and preserve the samples as described in Section 5.3. Analytical parameters are presented in Section 5.3.1.2.

In addition to the installation of monitoring wells and collection of ground water samples, soil samples will be collected from each of the new well locations. The boreholes for the well installation will be drilled using 3.25-inch I.D. hollow stem augers.

Subsurface soil samples will be collected as part of the standard penetration tests (ASTM D 1586-84) to be conducted at each boring. A stainless steel, 2-inch diameter split-barrel (split spoon) sampler will be used for sample collection. Samples will be collected continuously from 0 to 10 feet below ground surface, and at 5-foot intervals thereafter.

A geologist will maintain a detailed boring log. The log will serve as a record of sample collection, sample location and depth, and drilling procedures. The boring log will include:

- Heading information. Included will be the project number, site number, boring number, personnel responsible for logging the hole, ground elevation and coordinates, and date started and completed.

- Depths recorded in feet and tenths of feet.

- Detailed soil description including:

    - Major soil component
    - Secondary components and estimated percentages
    - Classification
    - Unified soil classification symbol
    - Color
    - Consistency of density

- Moisture content - listed as an adjective (e.g., dry, moist, wet)
- Texture
- Depositional origin

• Depth/elevation interval

• Depth/elevation of strata changes

• Water table information and method of determination

• Sample drive and recovery

• Blow counts, hammerweight, and length of fall

• Equipment details

• Drilling sequence and comments.

After logging a sample, the geologist will:

• Do an organic vapor scan of the soil in the split spoon using a HNu or similar device and record the value on the boring log.

• At analytical sampling intervals, a grab sample will be collected from the split spoon (typically two 40-ml glass for VOA or one 8-oz glass for cyanide).

• Place sample containers into iced secure storage until subsequent preparation and packaging.

Soil samples will be collected for chemical analysis (see Section 5.3.1.1) from the following intervals in each boring:

• 0.0 to 1.5 feet below ground surface.

• An intermediate 1.5 foot sampling interval to be determined by the attending geologist.

• The final 1.5 foot sampling interval of the boring.

4.3 SOILS INVESTIGATION

Some concern remains over the possibility of residual soil contamination in several areas of the site. Areas of particular concern are the:

• Underground cyanide overflow tank area
• Two underground lapping compound tank area
• Sanitary sewer line
• The RCRA storage area.

Based on the results obtained from the previous investigations and the facility closure activities performed to date, the need for extensive investigation of these areas does not appear to be warranted. The rationale for this belief is based on the fact that the compounds of concern are mobile within the hydrogeologic environment, yet, with the exception of chlorinated solvents, the compounds have not been detected in the ground water at the site. Therefore, only a limited investigation of the soils at the site will be conducted. The activities to be conducted are discussed in the following sections.

4.3.1 Soil Gas Survey

A soil gas survey will be conducted at the site. The purpose of the survey is to assist in the determination of the extent of the VOC plume at the site, and the potential for residual soil contamination in the product/waste storage areas and in the area of the sewer line. Figure 13 shows the location of the soil gas survey area.

The survey will utilize a 100 by 100 foot grid. At each grid point, soil gas readings will be taken from samples drawn from approximately 2.0 feet and 6.0 feet below the ground surface.

Prior to implementing the program, a test will be conducted at a site where there is known VOC detection in the ground. Soil gas readings will be taken at 2-foot depth increments to a maximum depth of 12 feet. Based on the difference between readings at the top and the incremental depths, the effectiveness of the 2.0- and 6.0-foot sampling depth will be critiqued. If appropriate, recommendations for a different sampling depth will be prepared.

A hole will be made by driving a small diameter plunger or slam bar into the ground. The hole will be made just prior to anticipated use to limit vapor exchange between soil and atmosphere. Upon completion of the hole, it will be checked for liquid to prevent pumping liquids into the detection instrument. At paved locations a hole will be drilled into and through the pavement to procure the soil gas sample from below the pavement.

A stainless steel tube will be inserted to the bottom of the sample hole for collection of the soil gas. The tube will be sealed at the ground surface with soil tamped into place to prevent ambient air flow into the annular space. In paved locations the seal will consist of moistened bentonite clay. The stainless tube will be directly connected to a direct reading photoionization (PID) for flame ionization (FID) detector with plastic tubing to provide undiluted readings.

The highest stable reading in the first 30 seconds will be recorded for later use. The reading may drop after an initial high as near surface air is drawn into the sample train. The instrument operator will give constant attention to the instrument scale to determine the first high stable reading before near surface air dilution affects the reading.

In addition to the soil gas survey, soil vapor readings will be collected from samples collected from the soil borings (Sections 4.2, 4.3.2, 4.3.3, and 4.3.4).

4.3.2 Underground Storage Tanks

Three underground storage tanks are located at the site (Section 2.0). During the process of discontinuing operations at the site, these tanks were emptied of their contents and cleaned. In addition, ground water monitoring wells located downgradient from the tank area have not detected concentrations in the ground water of compounds stored in the tanks. However, concerns remain over the potential for residual contamination of the soils in the immediate vicinity of the tanks.

Therefore, two soil borings will be drilled within the backfill at each of the two tank areas. Soil Borings SB-1 and SB-2 will be located adjacent to the cyanide tank. Soil Borings SB-3 and SB-4 will be located adjacent to the dapping compound tanks. The borings will be drilled at opposite corners of the backfill areas. The soil borings will be drilled and analytical samples collected in accordance with the procedures outlined in Section 4.2

Soil samples collected from the tank backfill areas will be analyzed for the parameters identified in Section 5.3.1.1.

4.3.3 Sanitary Sewer

Due to the state of disrepair of the sanitary sewer line, and the fact that the pretreatment facility at the site did not come on-line until mid-1981, concern exists over the potential for residual contamination of the soils around the sewer line. To address these concerns, three soil borings will be drilled near the abandoned sewer line. The borings will be extended to the water table (approximately 15 feet below ground surface). One boring will be completed as Monitoring Well MW-22 as discussed in Section 4.2 Figure 12 shows the boring locations.

The soil borings will be drilled and analytical samples collected in accordance with the procedures outlined in Section 4.2. Samples will be collected for the parameters indicated in Section 5.3.1.1.

4.3.4 Waste Storage/Depository Areas

Concern exists over the potential for residual soil contamination in the waste storage area. To address this concern, a soil boring will be drilled within the confines of the RCRA storage area. The boring will be extended to the water table. The boring will be drilled and analytical samples collected in accordance with the procedures outlined in Section 4.2. Analytical parameters are presented in Section 5.3.1.1.

4.4 SURFACE WATER/SEDIMENT INVESTIGATION

As indicated in Section 2.4.4, the 72-inch storm sewer acts as a ground water intercept at the site. In view of the fact that the storm sewer discharges to Hurricane Creek, and the fact that previous sampling of Hurricane Creek has indicated the presence of VOCs, additional sampling of the surface water and sediments of the creek is required to determine the nature and extent of the impact.

4.4.1 Surface Water Sampling

Surface water samples will be collected at the discretion of the EPA on-site coordinator. If samples are collected, a total of five surface water samples will be collected. Sampling locations are shown in Figure 14. The rationale for the sampling locations is as follows:

- SW01 - This sample location will provide background conditions of Hurricane Creek.

- SW02 - This sample location on Hurricane Creek is at the discharge point of the storm drain and will provide information on the maximum effect of the discharge on the creek.

- SW03 - This sampling location on Hurricane Creek will provide information on the dilution/dispersion effect that the creek has on the storm drain discharge.

- SW04 - Same as SW03.

- SW05 - This location at the inlet to the storm drain will provide background water quality entering the storm drain.

Sample locations SW01, SW02 and SW05 will be discrete grab samples. Sample SW01 will be collected from a discrete point within the creek, while sample SW02 will be collected as close as possible to the storm drain discharge.

VOCs add'l

Sample locations SW03 and SW04 will be composite samples collected from a series of subsamples along a transect across the creek. These composite samples will provide better representative results of the water quality and the effects of dispersion and dilution than would a single grab sample.

The following equipment will be needed to obtain surface water samples:

- Sample bottles and preservatives
- One 5-gallon stainless steel kettle
- Conductivity meter
- pH meter
- Thermometer
- Stainless steel Kemmerer or similar sampling device
- A graduated line with weight attached
- Distilled or deionized water
- pH paper
- Boat and its accessories (if necessary)

When collecting a grab surface water sample, the following procedures will apply:

- Record the date, time, weather conditions and any site-specific factors related to the water quality at each sampling location.

- Wade out into the water until a depth of at least two feet is reached, being careful not to disturb the sediments.

- Rinse all sample bottles at least once with the water from the source it is to be collected.

- Collect the sample by submerging each bottle approximately one foot below the surface and filling the bottle.

- Measure temperature of the point of collection.

- Return to shore and conduct pH and conductivity measurements on a portion of the sample.

- Place the sample bottles on ice in coolers and await shipment to the laboratory. (Sample preparation, storage and shipping procedures are described in Section 5.3.)

When collecting a composite surface water sample, the following procedures will apply:

- Record the date, time, weather conditions and any site-specific factors related to water quality at each sampling location.

- Set the number of sampling points along the transect. Generally, there will be three locations: at one-quarter, one half and three-quarters across the body of water,

- Measure water depth at each sampling point,

- Collect the sample from one foot below the surface,

- Equal volumes should be collected from each location and composited in the stainless steel kettle,

- Temperature should be measured immediately after collection of a subsample.

- Once the composite sample is collected, it should be mixed well and subsequently poured into the designated sample bottles.

- VOC samples will be taken at only one selected subsampling location; there will be no compositing of samples for VOC analysis.

- Measure the pH and conductivity of the composite sample and record in the sample collection log.

- Place the sample bottles on ice and await shipment to the laboratory. (Sample preparation, storage and shipping procedures are described in Section 5.3 of the Sampling Plan.)

The surface water samples will be analyzed for the parameters indicated in Section 5.3.1.3

4.4.2 Sediment Sampling

Sediment samples will be collected at each of the surface water sampling locations. Sediment samples will be collected concurrently with surface water samples. As with the water samples, sediment samples SD01, SD02 and SD05 will be discrete grab samples while samples SD03 and SD04 will be composite samples collected from a series of subsamples along a transect across the creek.

The following equipment will be needed to obtain sediment samples:

- Two stainless steel trays
- Stainless steel beaker
- Stainless steel spoon
- Hand sediment sampler
- A graduated line with weight attached
- Distilled or deionized water
- Boat and its accessories (if necessary).

When collecting a grab sediment sample, the following procedures will apply:

- Sediment samples will be collected at the same location as the water samples, after the water samples have been taken.

- Record the date, time, weather conditions and any site-specific factors related to each sampling location.

- Wade out into the water until a depth of at least two feet is reached.

- Collect the sample from approximately the top six inches with a hand sediment sampler.

- Place the sediment collected by the sampler onto a stainless steel tray, with subsequent transfer to the sample bottles by a stainless steel spoon.

- Place the sample bottles on ice in coolers and await shipment to the laboratory. (Sample preparation, storage and shipping procedures are described in Section 5.3.

When collecting a composite sediment sample, the following procedures will apply:

- Sample at the same locations as the water samples, after the water samples have been collected.
- Record the date, time, weather conditions and any site-specific factors related to each sampling location.
- Set the number of sampling points along the transect. Generally, there will be three locations: at one-quarter, one half and three-quarters across the body of water,
- Subsamples will be collected from approximately the top six inches of sediment at each location using a hand sediment sampler,
- Equal volumes should be collected from each location and composited in a stainless steel tray to form one total composite from the pond/lake.
- Once the composite sample is collected, it should be mixed well and subsequently spooned into the designated sample bottles by a stainless steel spoon.
- VOC samples will be taken at only one selected subsampling location; there will be no compositing of samples for VOC analysis.
- Place the sample bottles on ice and await shipment to the laboratory. (Sample preparation, storage and shipping procedures are described in Section 5.3.)

The samples will be analyzed for the parameters indicated in Section 5.1.3.4.

4.5 QUALITATIVE RISK ASSESSMENT

4.5.1 Introduction

The risk assessment is an integral part of the verification investigation process. While the overall objective of the investigation is that of verifying the extent of any releases that may have occurred from the facility, the objective of the risk assessment is to evaluate whether any potential releases pose an imminent or substantial risk to human health and the environment. In other words, documentation of a release is only one element of the issues that are involved in determination of an effect on the environment.

One fundamental concept forms the foundation for any risk assessment. That is, in order for a risk to be incurred, two conditions must be met: a hazard must be present and an exposure to that hazard must occur. For example, the presence of a chemical in water may not indicate a hazard if the concentration of the constituent is below the pertinent toxicity level. In addition, the presence of a substance that is defined as hazardous due to its intrinsic toxicological properties and concentration would not constitute a risk unless exposure were to take place.

The general form of a risk evaluation is similar regardless of its complexity. Each risk assessment contains the following four steps:

- Hazard Identification
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization

The initial information required for completing these steps forms the common ground work for risk assessments of increasing site-specific detail. If the qualitative risk assessment adequately demonstrates that the site does not pose an unacceptable risk to human health and the environment, then a quantitative risk assessment may not be necessary. Should the initial risk assessment identify data gaps, or indicate that a potential risk may be present, then a risk assessment that utilizes more site-specific information may be performed in order to better define the risks. The qualitative risk assessment then serves to focus additional efforts toward the areas requiring additional detail.

The qualitative risk assessment to be performed for this site will determine the potential for contributing to unacceptable health or environmental risk. This determination will be used in recommending if additional investigation, monitoring only under current conditions, or no action is required. This risk assessment integrates the information collected during the verification investigation program and supports the activities associated with any remedial measures should these be required.

4.5.2 Technical Approach

4.5.2.1 Hazard Identification

The sampling and analytical program outlined in Section 4.1 through 4.4 incorporates the guidance of the risk assessment staff to result in collection of sufficient data for the hazard identification step. The site will be reviewed for the following elements:

- Identification of the contaminants of concern, based on intrinsic toxicological properties or because they are present in large quantities or because of potentially critical exposure routes

- Physical nature of the contaminants known to be present

- Quantity and concentration of the contaminants of concern

4.5.2.2 Exposure Assessment

The objectives of the exposure assessment are to identify actual or potential exposure routes, characterize the exposed receptor population, and estimate the extent of exposure. The exposure assessment includes the following steps:

- Analyze release of contaminants
- Evaluate environmental fate and transport
- Analyze exposed populations
- Estimate exposure levels

Data for analyzing the potential release of contaminants will be obtained from the sampling and analytical program, as well as the historical data as available for the site. Information about the potential environmental fate and transport of the chemicals of concern will be presented, although for the purposes of this risk evaluation the chemicals will be assumed not to attenuate in the environment. This health protective approach provides a cushion for the uncertainty associated with estimating chemical release and transport rates.

The characteristics of the potentially exposed population will be identified for the entire site. This step will involve collection of demographic information as appropriate to determine the presence of high-risk population centers such as schools, day care centers, nursing homes, etc.

Estimation of exposure levels involves combining the information detailed above. Critical elements in estimating the exposure levels also include distance separating the site from the potentially impacted population, time pattern of exposure, and accessibility of the site. Site-specific characteristics and the intrinsic toxicity of the chemicals of concern affect determination of the pertinent potential pathways of exposure.

4.5.2.3 Toxicity Assessment

The toxicity assessment involves two steps:

- Qualitative toxicological evaluation
- Dose-response assessment

The toxicity assessment is an evaluation of the scientific data to estimate the nature and severity of potential health and environmental risks associated with the chemicals of concern at the site. The result of this task is a series of health effects summaries for the compounds of concern that describe the toxic properties both qualitatively and, where possible, quantitatively using the latest available published guidance.

The dose-response assessment integrates the intrinsic toxicological properties of the chemical, as identified in the toxicity assessment, with the exposure potential to define the relationship between the dose of the chemical and the incidence of an adverse effect.

For this risk evaluation, toxicological significance is defined in terms of the threshold reference (RFD) for chronic noncarcinogenic effects or the risk-specific dose (RSD) for carcinogens for the acceptable cancer risk level (51FR21650, June 13, 1986), as follows:

> "For noncarcinogens, these health limits are denoted as Reference Doses (RFDs). The RFD is an estimate of the daily dose of a substance which will result in no adverse effects even after a lifetime of such exposure. It is thus a chronic toxicity limit. The establishment of a chronic toxicity reference level for carcinogens requires setting a specific risk level which is then used to calculate the RSD. The RSD is the daily does of a carcinogen over a lifetime which will result in an incidence of cancer equal to the specific risk level. An RSD established at the 10^{-5} risk level translates to a probability of one in one hundred thousand that an individual might contract some form of cancer in his or her lifetime."

4.5.2.4 Risk Characterization

The risk characterization step involves comparing the projected doses of the chemicals of concern with the reference doses to calculate actual or potential risk associated with the site. The following types of risks will be characterized:

- Noncarcinogenic effects
- Carcinogenic effects
- Environmental risk

Both the individual and additive noncarcinogenic effects of the chemicals of concern will be evaluated using the Hazard Index which relates exposure level to the reference level. A similar approach will be followed for assessment of carcinogenic effects. The risk characterization will also include an evaluation of risk to the environment.

4.5.3 Site Evaluation

The risk assessment will result in a recommendation of one of the following for the site:

- Does not pose an unacceptable risk to human health and the environment and therefore does not require any additional monitoring or remedial action: Recommendation of "No Action"

- Does not pose an unacceptable risk to human health and the environment under current conditions but may pose a risk at some time in the future: "Recommendation of "Monitoring"

- Poses an actual risk to human health or the environment according to the existing level of data and requires additional site-specific data collection to better define the actual or potential risk: Recommendation of "Additional Investigation or remediation."

The results of the risk assessment will be integrated into the verification investigation as they become available to support the project decisions and enable Amphenol to plan potential future activities.

4.6 COMMUNITY RELATIONS

A Community Relations Plan has been prepared to provide a means for disseminating information regarding the RCRA Facility Investigation to be conducted at the Amphenol Corporation (Amphenol) facility in Franklin, Indiana. This Plan is composed of three parts:

- Progress Reports
- Community Official Briefings
- Project Contact

The components of this Plan are discussed in the following sections.

4.6.1 Progress Reports

Progress reports will be issued according to the following schedule:

- DURING FIELD ACTIVITIES - on a monthly basis, to be issued by the 10th of each month for the preceding month's activities.

- DURING NONFIELD ACTIVITIES - on a quarterly basis, to be issued by the 10th day following the end of the calendar quarter for the activities conducted during the quarter.

The progress reports will contain the following information:

- Period of time covered by the report
- Activities conducted during the report time period
- Problems encountered and how they were resolved
- Activities planned for the next reporting period
- Schedule

The progress reports will be transmitted to the U.S. EPA Region V and the Franklin County Health Department.

4.6.2 Community Official Briefings

Community officials, in particular the Indiana Department of Environmental Management and the ~~Franklin~~ Johnson County Health Department, will be invited to attend meetings held between the U.S. EPA Region V and Amphenol. In addition, those attending will receive copies of the minutes of the meetings.

4.6.3 Project Contact

A project contact will be established for interested parties to contact. It is anticipated that this contact will be Mr. Samuel S. Waldo, Amphenol Corporation, 358 Hall Avenue, Wallingford Ct. 06492, (203) 265-8760. The name of the project contact will be supplied to the Indiana Department of Environmental Management, Franklin County Heath Department, and the U.S. EPA Region V.

In addition, all personnel working on-site will be provided with the above information in the event that local citizens desire information during the course of the field program.

5.0 QUALITY ASSURANCE

The purpose of this Quality Assurance Project Plan (QAPP) is to document the procedures that will be undertaken to provide the precision, accuracy, and completeness of the data gathered during the investigation of the Amphenol facility in Franklin, Indiana by IT. This QAPP has been prepared in accordance with the Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (EPA-60014-83-004).

This QAPP has been prepared to document the measures that will be undertaken by IT and its subcontractors so the work performed will be of proper quality to accomplish project objectives and will be responsive to requirements of the U.S. EPA. The plan addresses:

- The QA (Quality Assurance) objectives of the project
- Specific QA procedures that will be implemented to achieve these objectives
- Staff organization and responsibility.

The requirements of the U.S. EPA with regard to QA focus on the acquisition of environmental data of known and acceptable quality. Other aspects of the project, such as engineering analysis and report preparation, will be controlled by the internal requirements of IT's QA Program.

The QA Program is documented in the IT Engineering Services and Analytical Services QA Manuals. The policies and procedures specified by the manuals serve to define acceptable practices to be employed by personnel engaged in any particular project. The IT QA Manuals are composed of controlled documents which are considered proprietary information, but applicable documents can be supplied to regulatory agencies for review upon request.

5.1 PROJECT ORGANIZATION AND RESPONSIBILITIES

All IT offices and laboratories operate under a comprehensive QA program. This program is an integral part of the daily activities of IT's managers, engineers, scientists, and technicians so that quality is "built in" as part of the normal course of work rather than "after the fact." Day-to-day implementation of the program is the responsibility of the QA officer for each office or laboratory. Overall responsibility for the direction and maintenance of the program rests with the Corporate Director of the QA Group and the IT Analytical Services (ITAS) QA Director. Specific responsibilities of key persons involved with the QA aspects of this project are outlined below.

5.1.1 Project Manager

The Project Manager (PM) will be the prime point of contact and will have primary responsibility for technical, financial, and scheduling matters. If significant deviations from this plan are encountered during the course of the investigation, the PM will consult with Amphenol personnel and obtain their approval to proceed if changes are required. The PM duties will include:

- Assignment of duties to the project staff and orientation of the staff to the needs and requirements of the project
- Supervision of the performance of project team members
- Budget and schedule control
- Review of subcontractor work and approval of subcontract invoices
- Review of interim reports on all task and subtask activities
- Establishment of a project record keeping system
- Review of all major project deliverables for technical accuracy and completeness
- Coordination of the QAPP activities including the Performance Audits and System Audits for field and laboratory
- Project closeout.

5.1.2 Quality Assurance Officer

Each engineering office has a designated Quality Assurance Officer (QAO) responsible to the individual directing that office. The QAO is responsible for implementing the engineering QA Program within an office with particular emphasis on the fulfillment of daily QA practices.

The basic concept of the QAO is to provide each office with a person knowledgeable in the details of the Environmental Projects Group (EPG) QA Program, and who is an integral member of that office. Responsibilities of the QAO are:

- Provide expertise for quality-related matters to an engineering office/group.
- Implement and verify on a generic basis the provisions of the EPG QA Program. This includes verifying on an ongoing basis that calculations are properly prepared and reviewed and the Office/Group Records Management System is maintained.
- Train project personnel in their quality-related responsibilities, i.e. field procedures, documentation, and sample packaging.
- Review of projects during initiation to determine if the provisions of the EPG QA Program are sufficient to meet the project quality requirements. If additional quality practices are needed, the QAO shall act as the project focal point for the preparation of additional/revised procedures.
- Preparation of project-specific QA outlines and documents.
- Preparation, or review and approval, of project-specific QA Plans with particular emphasis on the inclusion of adequate means for satisfying project quality requirements.
- Preparation for office/group quality-related procedures which supplement/amplify the provisions of the EPG QA Program because of the specific needs of that office/group.
- Perform project-specific QA audits on field procedures, documentation and report preparation.
- Respond directly to the EPG Corporate Director of QA, if nonconformances/corrective actions cannot be resolved through the PM.

5.1.3 Team Leaders

The Team Leaders will be responsible for coordinating all site activities with the PM, Amphenol personnel, the IT laboratory, and on-site subcontractors. The Team Leaders will be responsible for completing the work in accordance with this plan and notifying the PM of any changes to the plan that may be required. The duties the Team Leaders will perform include:

- Monitoring all drilling, well installation and sampling operations to provide that the drilling subcontractor and sampling team members adhere to the QA provisions of the plan
- Insuring that appropriate field logs are maintained for project activities
- Supervising the collection of all samples, and providing for their proper handling and shipping
- Processing and evaluating the results of the chemical analysis of the samples.

5.1.4 Corporate Director of Quality Assurance

The Environmental Projects Group (EPG) QA system is the responsibility of personnel whose primary function is the application of the EPG QA Program. These QA personnel include the Corporate Director of QA and his staff, and the QAOs located in the engineering offices.

The EPG QA Group is independent of all functional groups within IT. This provides the EPG Group with the independence necessary to develop, approve, and audit the QA Program discussed herein and provide an overview of its implementation. The Corporate Director of QA reports directly to the Vice President in charge of the EPG.

5.1.5 Analytical Services

5.1.5.1 Quality Assurance Director

The IT Analytical Services (ITAS) QA Director and staff are responsible for implementation and monitoring of the ITAS QA Program. The ITAS QA Director is independent of the laboratories' management and reports directly to the Vice President of ITAS.

The ITAS QA Director's responsibilities include:

- Approve ITAS QA document
- Perform audits of ITAS laboratories to verify compliance with the ITAS QA Program and project specific requirements
- Monitor and verify completion of corrective actions cited in audits (both internal and external)

- Act as collection point for proposed changes in ITAS QA Program and initiate changes in the program

- As necessary, discuss with Laboratory Directors, and the Vice President unresolved nonconformances brought to the QA Director's attention

- Ensure that all project work receives adequate QA review

- Provide input to the QA section of the final report.

5.1.5.2 Laboratory Director (ITAS, Export, Pennsylvania)

Responsibilities of the Laboratory Director shall, as appropriate, include:

- Report directly to Vice President of ITAS

- General supervision of the laboratory, including QA procedures

- Collaboration with the EPG in establishing sampling and testing programs

- Implement the QA Program within the laboratory

- Supervise QA activities

- Periodically determine effectiveness of the QA Program in the laboratory

- Approve Laboratory-Specific Attachments to the QA Manual and Project-Specific Manuals and revisions

- Recommend changes in the QA Program

- Maintain current distribution lists for Laboratory-Specific Attachments and Project-Specific Manuals

- Approve all reports issued by the laboratory

- Serve as the "focal point" for the reporting and disposition of all nonconformances

- Maintain current laboratory organization chart.

5.1.5.3 Laboratory Managers

Responsibilities of the Export, Pennsylvania, ITAS Laboratory Managers include:

- Manage a laboratory section's (organic, inorganic or geotechnical) daily analytical operations
- Direct the training and analysts in laboratory operations and analytical procedures
- Review all analytical data and submit to Laboratory Director for final approval
- Supervise the preparation and maintenance of laboratory records
- Supervise QA activities that are performed as part of routine analytical operations
- Supervise the sample storage facilities
- Define the preventive maintenance program.

5.1.5.4 Technical Director

The responsibilities of the Technical Director include the following:

- Manage the computer-based Laboratory Information Management Systems, including the Sample Analysis Management (SAM) System
- Provide technical overview of laboratory activities
- Serve as an "in-house" consultant for the applicability of general QA practices to specific needs
- Review all statistical data to verify the laboratory is meeting stated QA goals
- Evaluate new analytical techniques, procedures, instrumentation and QA methods, and provide recommendations to the Laboratory Director and Managers
- Verify software for data processing
- Recommend standards for purchasing instrumentation, equipment, reagents, gases, and chemicals
- Supervise laboratory participation in interlaboratory accreditation and proficiency programs
- Define the calibration program within the laboratory.

5.1.5.5 Quality Control Coordinator

Each laboratory has a designated Quality Control Coordinator (QCC). The QCC reports to the ITAS QA Director and is responsible for implementing the analytical QA Program within the laboratory, with emphasis on daily QA practices and ongoing performance evaluation.

Responsibilities of the Laboratory QCC are:

- Prepare and insert QA samples and Performance Evaluation samples into the sample stream, and analyze results
- Ensure the maintenance of sample chain of custody and project document control
- Perform statistical analysis using data from QA samples
- Resolve ongoing nonconformances within the laboratory
- Report nonconformances to the ITAS QA Director if the situation is not corrected within the laboratory
- Review data packages for compliance with project requirements
- Assist in QA systems audits and perform QA performance audits periodically
- Train analysts in QA procedures
- Oversee instrument preventive maintenance schedules
- Stop production in the event that out-of-control conditions warrant such an action.

5.1.5.6 Group Leaders/Laboratory

Group Leaders will be responsible for assessing laboratory data to determine its validity and reliability for its intended use. Other specific responsibilities of Group Leaders include:

- Organize and schedule the analytical testing program with consideration for sample-holding times
- Serve as Lead Analyst within the group (group meaning metals, general chemistry, geochemistry, TOC-TOX, gas chromatography, gas chromatography - mass spectrometry and geotechnical)
- Lead the training of analysts in analytical procedures within the group
- Implement data verification procedures

- Review of routine CLP services preparation and final data review of CLP and special analytical services

- Assign analysts for data processing and validation activities

- Prepare data summaries for review by the Laboratory Manager

- Evaluate instrument performance and supervise instrument calibration and preventive maintenance programs

- Report out-of-control or nonconforming situations to Laboratory Director, and QCC, as appropriate.

5.1.5.7 Field Services Compliance Coordinator

Responsibilities of this position include:

- Project initiation
- Client contact
- Supervise sample container shipping and receiving.

5.1.5.8 Section Technical Manager

The Section Technical Manager performs the following tasks:

- Initiates new and modifies existing analytical methodologies
- Coordinates testing program for 50 percent of section's projects
- Provides final data checks and writes final report
- Provides technical guidance to industrial and government clients
- Evaluates new instrumentation
- Reports to Technical Director.

5.1.5.9 Analysts

Assigned responsibilities for ITAS analysts include:

- Perform analytical procedures and data recording in accordance with accepted methods

- Perform and document calibration and preventive maintenance of instrumentation, as appropriate

- Perform data processing and validation

- Immediately report out-of-control situations, instrument malfunctions, calibration failure, or other nonconformances to the Group Leader and QCC, as appropriate.

5.2 QUALITY ASSURANCE OBJECTIVES

The purpose of the QAPP is to define the procedures for the evaluation and documentation of field sampling, analytical methodologies, and the reduction and reporting of data. The QAPP provides a uniform basis for conducting these tasks.

The scope of the program includes the field and laboratory operations such as sample collection, sample receipt, laboratory analysis, and data reduction/reporting. The scope also includes audit procedures used to evaluate the application of the procedures defined in this plan.

Compliance with the elements of the QA program will provide the following:

- The data generated will be of sufficient or greater quality to stand up to scientific, regulatory, and legal scrutiny
- The data will be collected or developed in accordance with procedures appropriate for its intended use
- The data will be of known and acceptable accuracy, precision, representativeness, and completeness as required by the project.

This QAPP has been prepared in direct response to these goals. The remaining sections of the plan describe the QA procedures to be implemented and the procedures to be followed by IT and its subcontractors during the course of the project. These procedures will also:

- Maintain the necessary level of quality of each aspect of the analytical program by providing the appropriate level of verification, testing, checking and statistical analysis of the laboratory program procedures.
- Assist in the early recognition of factors which may adversely affect the quality of data and provide for the implementation of procedures to correct these adverse effects.
- Enhance the utility of all data produced by the laboratory for decision-making purposes by requiring sufficient documentation of the testing process. This provides information on the limitations of the analytical results.

In this regard the QAPP will provide for the definition and evaluation of the parameters discussed in the following sections.

5.2.1 Detection Limits

The detection limit for a given parameter is defined as the minimum concentration that can be determined from an instrument signal that is three times the background noise.

5.2.2 Data Precision And Evaluation

Precision is a measure of the mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. The Relative Percent Difference (RPD) parameter will be used to define the precision between replicate analyses. This parameter is defined in Section 5.5.3.1 The precision objectives for the organic analyses will be the same as those established by the methodology. Nonhomogeneous constituents in the soil samples may produce poor precision in the results.

5.2.3 Data Accuracy And Evaluations

Accuracy is defined as the degree of agreement of a measurement with an accepted reference or true value. The Percent Recovery (%R), determined by sample spiking, is typically used to define the accuracy of an analytical procedure. This parameter is defined in Section 5.5.3.2. The accuracy objectives for the organic analyses will be the same as those established by the U.S. EPA for its CLP. Nonhomogeneous constituents in the soil samples may also affect the percent recovery results, if the native analytes in the spiked and unspiked aliquots have different concentrations.

5.2.4 Completeness Of Data

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct normal conditions. Over 90 percent of all data obtained on this project should be valid based upon evaluation of the QA data.

5.3 SAMPLING AND SAMPLE CUSTODY PROCEDURES

5.3.1 Sample Numbers and Types

Obtaining high quality data is essential in the assessment of the sources, types and extent of contaminants which are present at the Amphenol Site. Thus, proper collection procedures for taking samples at the site are of key importance to this investigation. Details concerning the sampling program are presented in the Technical Work Plan (Section 4.0) which addresses the sampling objectives, the selection of sampling locations, sampling methods and equipment, and sampling team personnel. Samples will be collected from soil borings, monitoring wells, and selected surface water and sediment sampling locations.

5.3.1.1 Soil Boring Samples

Soil samples will be collected from the six borings drilled for subsequent monitoring well installation. In addition, seven borings will be drilled specifically for the collection of soil samples. It is anticipated that three soil samples will be collected per boring: one near the surface; one at the water table; and one at the bottom of the boring. The numbers of samples to be collected during the soil boring sampling are presented in Table 5. Also presented in this table are the analytical procedures which will be performed on each sample.

5.3.1.2 Ground Water Samples

As noted in the Technical Work Plan (Section 4.0), six monitoring wells will be installed by IT. These wells will be sampled at a time at least one week after their development. Additionally, six other wells previously installed by IT and ATEC are to be sampled . (Procedures to be used by IT in purging and sampling the wells are described in Section 4.0.) The number of samples collected and the analytical parameters to be tested from these ground water sampling locations are contained in Table 5.

Duplicate ground water samples will be collected from selected wells for metals analysis. Of these samples, the primary sample will be analyzed in an unfiltered state, while the duplicate will be analyzed in a filtered state. The rationale for collecting the duplicate sample is twofold, these being:

* A comparison of the filtered versus the unfiltered results will provide information on the impact on the ground water quality caused by the suspended particles, and

* The potential receptors at the site are served by a public water supply system which utilizes a filtration method in preparing the ground water for distribution. In order to accurately perform the risk assessment, it is necessary to have analytical results that are comparable to what the potential receptors may be receiving.

5.3.1.3 Surface Water Samples

Part of the sampling program to be conducted at the Amphenol facility entails collecting five grab surface water samples, including four samples from Hurricane Creek. The locations and methods for collecting these samples are provided in Section 4.0. Parameters to be analyzed from these samples are noted in Table 5.

5.3.1.4 Sediment Samples

Sediment samples will be collected at the same locations as the surface water samples. The sediment samples collected from Hurricane Creek will either be single grab samples or composites of subsamples collected along a transect at the sampling location. (Specific details of the sediment sampling are given in Section 4.0.) The number and types of sediment samples to be obtained are shown in Table 5.

5.3.2. Sample Preparation, Preservation, Storage, And Shipping

Sample preparation, packaging and shipping will conform to U.S. EPA guidelines. All samples collected for this project are assumed to be classified as "low level" or environmental samples for packaging and shipping purposes. If medium or high hazard samples are encountered, they will be prepared in accordance with the appropriate sample handling protocol. Procedures for low level samples are described below.

5.3.2.1 Bottles and Preservatives

Tables 6 and 7 summarize sample bottle and preservative requirements for the analytical parameters of concern at the Amphenol facility. All bottles will have teflon-lined lids and will be provided by IT's CLP Laboratory in Export, Pennsylvania.

5.3.2.2 Sample Preparation

As each sample is collected in the field, it will be placed in labelled bottles and stored in an iced cooler. Water samples for metals analysis will not be field filtered, however duplicate water samples will be field filtered (see Section 5.3.1.2). Sample preparation will include sealing the bottles with tape, properly labelling and tagging them, and storing them on ice. Chain-of-custody documents will be prepared for all samples which will be shipped to a laboratory.

5.3.2.3 Storage and Shipping

Samples which will be shipped to the laboratory for analysis will be prepared for shipment using the following procedures:

- Tighten sample bottle lids "hand" tight, no tape will be used to secure lids
- Mark volume level on bottle with grease pencil (liquid sample only)
- Place about 3 inches of packing material (zonolite, vermiculite, etc.) in bottom of waterproof metal or equivalent strength plastic cooler
- Place bottles in clear plastic bags in the cooler in such a way that they do not touch
- Put VOC vials in Ziploc bags and place them in the center of the cooler
- Put ice in plastic bags and place in cooler on and around bottles; especially on VOC vials (Approximately three bags of ice are necessary per cooler)
- Fill cooler with packing material
- Put paperwork in plastic bags and attach to cooler with masking tape or duct tape to the inside lid of cooler
- Tape drain shut
- Close cooler and secure lid by taping cooler completely around with strapping tape at two locations
- Place lab address on top of cooler
- Put "This Side Up" and "Fragile" labels on the cooler (CAUTION: Do not cover labels with strapping tape)

- Affix custody seals on front right and back left of cooler; cover seals with wide, clear tape.

While awaiting screening or packaging, samples will be stored on ice in coolers. All samples will be preserved on the same day that they are collected. If samples cannot be shipped on the same day that they would be packaged, packaging will be delayed until the following morning so that the samples can be shipped with a full load of ice. These samples will be stored on ice in coolers, and kept in a secure area.

After the samples have been packaged for shipping, custody will be transferred to a team member who will ship the coolers via overnight courier. Upon shipment of the samples, the laboratory will be notified that a sample shipment is scheduled to arrive. An effort will be made to provide the laboratory with a one-week advance notice of sample shipment, however, in some instances this may not be practical due to variable field schedules.

5.3.3 Documentation

Project sampling activities will be documented by keeping a written record of daily sampling activities and implementing a series of interrelated chain-of-custody procedures. This will assure the integrity of laboratory data by tracking and documenting samples from the time they are collected by the sampling team and as they move through the laboratory.

5.3.3.1 Sample Numbering System

A sample numbering system will be used to identify each sample. This numbering system will provide a tracking procedure to allow retrieval of information about a particular sample and assure that each sample is uniquely numbered. The sample identification numbers will be composed of the components which are described below.

- Project Identification A three letter designation will be used to identify the facility where the sample is collected. For this project, it will be AMP (for Amphenol).

- Sample Type Each sample type collected during the sampling program will be identified by a two-digit alpha code:

  - SB - Soil boring (subsurface soil)
  - MW - Monitoring well (ground water)
  - SD - Sediment
  - SW - Surface Water.

- Sample Location A two-digit number will be used to indicate the specific sampling location within a site.

- Sample Number A two-digit number will be used to consecutively number sequential samples taken at a specific sampling location. This number is most applicable to soil boring samples and/or when subsequent sampling events occur at monitoring wells, surface water and sediment sampling locations. An example of a complete sample identification number is:

AMP-SB01-01 -- Amphenol Soil Boring Number 1 - Sample Number 1.

5.3.3.2 Sample Custody

Chain-of-custody procedures are intended to document sample possession from the time of collection to disposal, in accordance with federal guidelines.

For the purpose of these procedures, a sample is considered in custody if it is:

- In one's actual possession
- In view, after being in physical possession
- Locked so that no one can tamper with it, after having been in physical possession
- In a secured area, restricted to authorized personnel.

These procedures will be followed for all samples for this project:

- Sample containers will be custody sealed in the field. Any samples that do not arrive at the laboratory with custody seals intact will not be considered to have been in valid custody.
- An IT chain-of-custody record (Figure 15) will be initiated in the field for each sample. A copy of this record will accompany its sample.
- Each time responsibility for custody of the sample changes, the new custodian will sign the record and denote the date.

- Upon sample destruction or disposal, the custodian responsible for the disposal will complete the chain-of-custody record, file a copy and send a copy to the PM or to his designated representative for record keeping.

- The custody of individual sample containers will be documented by recording each container identification on an appropriate chain-of-custody form.

- Analyses for each sample will be recorded on an IT Request for Analysis Form (Figure 16).

- The following documentation will supplement the chain-of-custody records:

  - Daily activity log (Figure 17) ultimately to be filed in the project files

  - Sample label (Figure 18) on each sample

  - Sample seal on each sample

  - Sample collection log (Figure 19)

  - Photographic records (wherever practical).

- Prior to sampling, all personnel involved will have received copies of the chain-of-custody procedure.

5.3.3.3 Sample Collection Logs

Sample collection logs (Figure 19) will be completed in the field for each sample acquired. In the case of soil boring samples, the boring log (Figure 20) will contain all the necessary sample information and therefore an actual sample collection log will not be completed. The information to be provided on these forms will include, but not be limited to:

- Project name and number

- Sample number (unique)

- Sampling location (e.g., boring, depth or sampling interval, and field coordinates)

- Sampling date and time

- Individual performing the sampling

- Preservation method employed

- Sample type (grab, composite, etc.)

- Sampling method description (elevation/depth of acquisition, etc.)

- Results of any field tests performed on the sample.

5.3.3.4 Sample Labeling

Sample labels (Figure 18) must contain sufficient information to uniquely identify the sample in the absence of other documentation. This will include as minimum:

- Project number
- Unique sample number
- Sample location (and depth, if applicable)
- Sampling date and time
- Individual collecting the sample
- Preservation method employed.

The sample label will always be directly affixed to the sample container and will always be completed using indelible ink.

5.3.4 Decontamination Procedures

In order to prevent cross contamination between samples taken for chemical analysis, tools, sampling devices, instruments, etc., will be thoroughly decontaminated between each use. The general decontamination procedures to be observed are as follows:

- Wash with an industrial detergent (e.g., TSP or Alconox) and water using brushes to remove any gross contaminants

- Rinse with clear water by dipping and/or spray bottle

- Rinse with nanograde methanol by spray bottle

- Double rinse with deionized water by spray bottle.

Power spraying may be substituted for spray bottle rinsing.

The following specific procedures will also be followed:

- Drill rig, drill tools, equipment, pipe and casing will be steam cleaned before entering the site.

- Drilling tools and equipment will be steam cleaned between holes.

- All external fixtures of pumps will be decontaminated. Pumps will be cleaned internally by power wash with water, if possible, or by circulating a cleaning solution through the pump.

- Each bailer will be thoroughly decontaminated prior to use in a well. Bailers may be dedicated to wells and remain hung in the wells as property of Amphenol.

- The split spoon sampler will be decontaminated between each sample drive and steam cleaned between borings.

5.3.5 Processing of Samples by Laboratory

5.3.5.1 Receipt of Samples by Laboratory

The first step in the processing of samples is the notification to the laboratory by field personnel of incoming sample shipments. This information is taken by the Field Services Compliance Coordinator. The Field Services Compliance Coordinator will note that the shipment is expected and notify the Laboratory Manager or Group Leaders of the incoming samples.

Initial processing of the samples is handled in the following manner with supervision by the Field Services Compliance Coordinator:

- Examine all samples and determine if proper temperature has been maintained during shipment. If samples have been damaged during shipment, the remaining samples will be carefully examined to determine whether they were affected. Any samples affected will be considered damaged. It will be noted on the chain-of-custody record that specific samples were damaged and that the samples were removed from the sampling program. Field personnel will be notified as soon as possible that samples were damaged and that they must be resampled, or the testing program changed.

- Compare samples received against those listed on the chain-of-custody and Request for Analysis Forms.

- Verify that the sample holding times have not been exceeded.

- Sign and date the chain-of-custody form and attach the waybill to the chain-of-custody.

- Place the samples in adequate laboratory storage.

- Enter the samples in the laboratory sample log-in book which contains the following information:

- Project identification number
- Sample numbers
- Type of samples
- Date received in laboratory
- Date put into storage after analysis is completed
- Date of disposal.

• Notify the Laboratory Manager or Group Leaders of the arrival of the samples.

• Place the completed chain-of-custody records in the project file.

If samples collected by IT personnel arrive without chain-of-custody or incorrect chain-of-custody records, the following will be done:

• If the chain-of-custody is incorrect, a memorandum to the PM and field personnel will be prepared stating the inaccuracy and correction. The memorandum will be signed and dated by the person originating the chain-of-custody and the QCC. The memorandum will serve as an amendment to the chain-of-custody. If the information on the chain-of-custody form cannot be corrected by the QCC or the field personnel, the samples affected will be removed from the sampling program.

• If the chain-of-custody is not shipped with the samples, the field personnel will be contacted and a memorandum prepared which lists the persons involved in collecting, shipping and receiving the samples and the times, dates and events. Each person involved will sign and date this memorandum. The completed memorandum will be maintained in lieu of the chain-of-custody.

5.3.5.2 Laboratory Storage of Samples

The primary considerations for sample storage are:

• Maintenance of prescribed temperature, if required, which is typically four degrees Centigrade.

• Extracting and/or analyzing samples within the prescribed holding times for the parameters of interest.

All extraction and chemical analyses of samples collected for the project will conform to the holding times given in Tables 6 and 7. Placement of samples in the proper storage environment is the responsibility of a sample custodian, who will notify the Laboratory Manager, or Group Leaders, if there are any samples which must be analyzed immediately because of holding-time requirements.

5.3.5.3 Initiation of Testing Program

As stated in previously, a Request for Analysis Form will be submitted with the samples to the laboratory. If the analytical program is not defined with the sample shipment, the Field Services Compliance Coordinator will immediately notify the PM responsible for definition of the analysis program.

The Laboratory Manager and Group Leaders are responsible for prioritizing samples on the basis of holding time and required reporting time into the laboratory sample stream.

5.3.5.4 Sample Disposal

The chain-of-custody forms for the samples are completed as part of sample disposal. There are several possibilities for sample disposition:

- The samples may be completely consumed during analysis.
- Samples may be returned to the client or location of sampling for disposal.
- The samples may be stored after analysis. Proper environmental control and holding time must be observed if reanalysis is anticipated. If reanalysis is not anticipated, environmental conditions for storage will not be observed.

The Laboratory Manager will determine disposition of samples if not specified in the Request for Analysis Form. In general, ITAS will not maintain samples and extracts longer than six months beyond completion of analysis, unless otherwise specified.

5.4 ANALYTICAL METHODS/PROCEDURES

Analytical work generated from this project will be performed at IT's Analytical Laboratory in Export, Pennsylvania. This laboratory is currently qualified under the U.S. EPA CLP.

The analyses of water and soil/sediment samples will be performed according to the U.S. EPA approved methods presented in Table 8. Reference sources for these methods are included in Table 8 or in the footnotes to Table 8. Operating parameters, chemicals, standards, procedures, calculations, etc. are contained in the referenced methods. Detection limits for each set of analytical parameters are presented in Table 9 (VOCs) and Table 10 (inorganics). The makes and models of various field analytical and laboratory instrumentation which may be used for this project are included in Tables 11 and 12.

5.4.1 Analytical Parameter Rationale

The number of samples to be collected and the analytical parameters to be determined are presented in Table 5. The parameters selected for analysis have been based on past analytical results, and to some extent, the compounds utilized at the site.

The RCRA Facility Investigation Guidance Document recommends that the Appendix IX parameters be analyzed for in any sample collected. However, the document also indicates that, based on existing information, the Appendix IX list may be shortened or revised to reflect site-specific conditions. Utilizing this premise, the selected analytical parameters for this investigation have been limited to:

- Hazardous Substance List Metals
- VOCs
- Total and Amenable Cyanide

These samples have been selected based on the following items:

- Table 13 presents the parameters analyzed for during the previous investigations. As can been seen in the table, VOCs, A/B/Ns, metals, and pesticides/PCBs have been analyzed for at the site. As the table also indicates, the compounds that have been detected at the site include only VOCs, metals, and cyanide.

- Although some of the analytical data may be considered invalid due to the method of well construction (placing contaminated surface soils around the well screen as backfill material), the fact that A/B/Ns and pesticides/PCBs were not detected is strong evidence that these compounds are not present at the site as contaminants of the ground water or soils.

- Although a list of the compounds used at the site does not exist, the fact that the facility was utilized for plating operations indicates that the primary compounds used would consist of solvents (primarily volatile compounds), metallic salts or liquids (metals), and corrosive liquids (Hydrochloric Acid, Phosphoric Acid, Nitric Acid, Chromic Acid, Sulfuric Acid etc.)

Based on the use of the site as a plating facility, the compounds typically utilized at plating facilities, and the compounds detected during previous investigative activities at the site, the need for including the entire Appendix IX list does not appear warranted.

5.5 ANALYTICAL/STATISTICAL/CONTROL PARAMETERS

QA samples can originate either in the field or in the laboratory. Field samples include travel (trip) blanks, field duplicates and splits, and field equipment rinsate blanks. QA samples originating in the laboratory include method blanks, check standards, surrogate standards, and project-specific samples such as duplicates and matrix spike/matrix spike duplicates. The function of these different sample types and the number of each that will be analyzed by sample matrix are summarized below.

5.5.1 Numbers and Types of Quality Assurance Samples

5.5.1.1 Field Quality Assurance Samples

To check the quality of data from field sampling efforts, travel blanks, duplicates and splits, and equipment rinsate blanks will be collected for analysis. These will be treated as separate samples for identification, logging and shipping. The number of QA samples to be collected during the site investigation are presented in Tables 14 and 15.

5.5.1.1.1 Travel Blank Sample Analyses

Travel (trip) blanks accompany the sample bottles through collection and shipment to the laboratory and will be stored with the samples. Their purpose will be to determine if the activities of the sampling team introduce volatile VOCs into the samples that would not otherwise be present. In general, a minimum of one travel blank may be submitted with each group of samples to be analyzed for VOCs.

5.5.1.1.2 Field Duplicate/Split Sample Analyses

Field duplicate/split samples will be collected to evaluate the precision of the collection procedures. Duplicate samples are defined as follows:

- For soils and sediments, the collection by the same technique of two separate samples immediately adjacent to one another

- For ground water and surface water, the collection of two samples from the same well or from the same location in a body of water.

QA samples to be analyzed for VOCs must be duplicates.

Splits are defined as subsamples of the original sample. The amount of subsample taken is determined by the number of splits to be taken, usually such that all subsamples and the original sample contain an equal amount of material.

5.5.1.1.3 Field Equipment Rinsate Blanks

Field equipment rinses are used to determine if the decontamination procedures are effective in cleaning the sampling equipment. Equipment rinsate will be collected from equipment that has been used for repeated sampling efforts. The equipment will be rinsed after decontamination and prior to sampling. The procedure will be to thoroughly rinse with deionized water all surface areas of equipment that come into contact with the sample. The rinsate will be collected in a clean stainless steel container, or of the same type used for sampling, and poured into the appropriate sample containers with the proper preservatives added.

5.5.1.2 Quality Assurance Samples Originating Within the Laboratory

QA samples of known content and concentration introduced by the laboratory are analyzed together with the project samples so that the accuracy and precision of the analytical data can be evaluated. The numbers and types of these samples are discussed below. Procedures for introducing these samples into the sample stream are described in the applicable IT Standard Operating Procedure (SOP). (IT SOPs referred to in this QAPP may be provided for review upon request.)

5.5.1.2.1 Method Blank Analyses

A method blank is a volume of deionized, distilled laboratory water carried through the entire analytical procedure. The volume of the blank must be approximately equal to the sample volume processed. One method blank will be performed with each sample set accompanied by QA samples. Analysis of the blank verifies that method interferences caused by contaminants in solvents, reagents, glassware, and other sample processing hardware are known and minimized. Results of method blank analyses will be maintained with the corresponding analytical data in the project file.

5.5.1.2.2 Duplicate Sample Analyses

Duplicate analyses are performed to evaluate the precision of an analysis. Results of the duplicate analysis are used to determine the relative percent differences between replicate samples. Duplicate analyses will be performed only if the matrix spike/matrix spike duplicate analyses cannot be run. This would be the case, for example, if insufficient sample volume is available to perform the matrix spike/matrix spike duplicate analyses. In such cases, one duplicate will be analyzed with each sample set accompanied by QA samples. Duplicate analysis results will be summarized on the QA data summary forms.

5.5.1.2.3 Check Standard Analyses

Because standards and calibration curves are subject to change and can vary from day to day, a midpoint standard or check standard will be analyzed based on the following schedule:

Department	Frequency of Analyses
GC/MS	1 every 12 hours
GC	1 every 10 analyses
Water/Wastewater	1 per batch of samples analyzed
Metals	1 every 10 samples

Analysis of this standard is necessary to verify the standard curve and in some cases may be sufficient for calibration. The results of this analysis will be entered in the instrument calibration log and on the QA data summary form.

5.5.1.2.4 Surrogate Standard Analyses

Surrogate standard determinations will be performed on all samples and blanks for GC/MS analyses. All samples and blanks will be fortified with surrogate spiking compounds before purging or extraction to monitor preparation and analysis of samples. Surrogate standard data will be summarized on the surrogate recovery form. Acceptable surrogate recovery ranges for VOCs are noted below:

SURROGATE COMPOUND	QA LIMIT-WATER	QA LIMIT-SOIL
Toluene-d8	88-110	81-117
Bromofluorobenzene	86-115	74-121
1-2-Dichloroethane-d4	76-114	70-121

5.5.1.2.5 Matrix Spike and Matrix Spike Duplicate Samples

To evaluate the effect of the sample matrix upon analytical methodology, separate aliquot portions of selected samples will be spiked with specific analytes. For organics, this will be accomplished by the use of matrix spike and matrix spike duplicate samples. For inorganics, the spiked samples may or may not be the same as the sample analyzed in duplicate. One spiked sample and duplicate will be analyzed for each sample set accompanied by QA samples. Matrix spike results will be summarized on the QA data summary form.

5.5.2 Processing Of Quality Assurance Data

The results of the chemical analyses of the QA samples will be used to evaluate the procedures of the sample team and to demonstrate that the analyses performed by the laboratory are within prescribed boundaries for accuracy and precision. The procedures used to calculate these parameters are described in Section 5.5.3. The information to be gained from review of the different types of QA samples is presented below.

5.5.2.1 Travel Blank Evaluation

Travel blank results will be evaluated for high readings similar to the reagent and/or method blanks described below. If high travel blank readings are encountered, the procedure for sample collection, shipment, and laboratory analysis will be reviewed. However, if both the reagent and/or method blanks and the travel blanks exhibit significant background contamination, the source of contamination is probably within the laboratory.

5.5.2.2 Field Duplicate/Split Evaluation

Field duplicate/split data will be evaluated for differences in analyte concentrations. Substantial differences in results from duplicate/split samples are indicative of a heterogeneous matrix or inconsistent sampling practices. In general, duplicate/split water samples should show greater similarity in chemical composition than soil or sediment samples. This is due to the manner in which they are collected and to physical/chemical mechanisms (e.g., diffusion) that promote sample uniformity in liquid matrices.

5.5.2.3 Field Equipment Rinsate Evaluation

Field equipment rinsate data will provide information as to the effectiveness of the decontamination procedures. The presence of similar concentrations of parameters in both the field equipment rinse and the investigation samples is indicative of improper decontamination practices, thereby causing samples to be unrepresentative of the matrix from which they were collected. However, if analytes are present at much lower levels in the equipment rinse than in the investigation samples, then adjustments can sometimes be made in the data to correct for the low levels of introduced contaminants.

5.5.2.4 Method Blank Evaluation

The method blank results will be evaluated for high readings characteristic of background contamination. If high blank values are observed, laboratory glassware and reagents will be checked for contamination and the analysis halted until the system can be brought under control before further sample analysis proceeds. A high background is defined as a background value sufficient to result in a difference in the sample value, if not corrected, greater than or equal to the smallest significant digit known to be true. A method blank should contain no greater than two times the parameter detection limit for most parameters (i.e., VOCs; base-neutral, acid and pesticide organic compounds; and metals).

5.5.2.5 Duplicate Sample Evaluation

Duplicate sample analysis for the sample set will be used to determine the precision of the analytical method for the sample matrix, as defined by the relative percent difference (RPD) value (see Section 5.5.3.1.). The RPD value will be compared to established quality control limits. If the RPD does not meet this limit, the cause of this failure will be investigated and corrective action may be initiated. The samples would be reanalyzed, for example, if the failure to meet control limits was found to be due to instrument malfunction, operator error, or other identifiable cause within the control of the laboratory.

5.5.2.6 Check Standard Evaluation

The results of the check standard analysis will be compared with the true values and the percent recovery of the check standard will be calculated. If correction is required, appropriate measures will be taken and the check standard will be reanalyzed to demonstrate that the corrective action has been successful.

5.5.2.7 Surrogate Standard Evaluation

The results of surrogate standard determinations will be compared with the true values spiked into the sample matrix prior to extraction and analysis. The percent recoveries of the surrogate standards will then be compared with the values recommended as attainable by the U.S. EPA for VOCs and semivolatile organic compounds.

5.5.2.8 Matrix Spike Evaluation

The accuracy of the analytical method will be assessed by comparing the observed recovery of the spike with the theoretical spike recovery. The percent recovery value will be compared to established quality control limits. If the accuracy value exceeds these control limits, the cause for this will be investigated and corrective action may be initiated. The samples would be reanalyzed, for instance, if it is found that the failure to meet control limits was due to instrument malfunction, operator error, or other identifiable causes within the control of the laboratory.

5.5.3 Statistical Evaluation Of Precision And Accuracy

The project objectives relative to the precision and accuracy of the analytical data are presented in Tables 16 and 17, respectively. The procedures the laboratory will follow to calculate these parameters are given below.

5.5.3.1 Evaluation of Analytical Precision

To determine the precision of the method and/or laboratory analyst, a routine program of replicate analyses will be performed. The results of the replicate analyses will be used to calculate the RPD, which is the governing quality control parameter for precision.

The RPD for replicate analyses is defined as 100 times the difference of each replicate set, divided by the average value of the replicate set. For replicate results D_1 and D_2, the RPD is calculated from Equation 5-1:

$$RPD\% = \frac{D_1 - D_2}{\frac{D_1 + D_2}{2}} \times 100\% \qquad (5\text{-}1)$$

5.5.3.2 Evaluation of Analytical Accuracy

To determine the accuracy of an analytical method and/or a laboratory analyst, a periodic program of sample spiking will be conducted. The results of sample spiking will be used to calculate the quality control parameter for accuracy evaluation, the Percent Recovery (%R).

The %R is defined as 100 times the observed concentration, minus the sample concentration, divided by the true concentration of the spike.

$$\%R = \frac{O_i - O_s}{T_i} \times 100\% \qquad (5\text{-}2)$$

where

$\%R$ = the Percent Recovery,

O_i = the Observed Spiked Sample Concentration,

O_s = the Sample Concentration, and

T_i = the True Concentration of the Spike.

The true concentration of the spike is calculated as follows:

$$T_i = \frac{\text{Spike Concentration (mg/l) x Volume of Spike (in ml)}}{\text{Volume of Sample [in ml] + Volume of Spike [in ml]}} \qquad (5\text{-}3)$$

It must be recognized that QA objectives may be attainable only for samples that are homogeneous and "well-behaved." In the event that specific QA objectives cannot be met for specific samples, groups of samples, or sample types, the laboratory will make every reasonable effort to determine the cause on nonattainment and, if such is due to instrument malfunction, operator error, or other identifiable cause within the control of the laboratory, the samples affected will be reanalyzed, if possible. Should nonattainment of QA objectives be due to sample inhomogeneity, sample matrix interference, or other sample-related causes, reanalyses will be treated as an additional analyses. For many U.S. EPA-approved methods, interlaboratory method verification studies have been used to establish QA criteria which may be regarded as an inherent part of the method. In those cases, such criteria will take precedence except for deviations from such criteria that can be reasonably attributed to sample-related cases.

5.6 INSTRUMENT CALIBRATION PROCEDURES AND FREQUENCIES

Instruments and equipment used to gather, generate or measure environmental data will be calibrated with sufficient frequency and in such a manner that the accuracy and reproducibility of results are consistent with the manufacturer's specifications. Laboratory and field testing equipment used for analytical determinations fall into two general categories: those calibrated prior to each use and those calibrated on a scheduled basis.

All measuring, test equipment and referenced standards will be calibrated at prescribed intervals and/or prior to initial use. Frequency will be based on the type of equipment, inherent stability, manufacturer's recommendations, values given in national standards, intended use and experience. For all analyses for which U.S. EPA-approved methods exist, IT's laboratories will employ these methods and follow the calibration procedures and frequencies specified. For GC/LC instruments, organic prep sonicator horns, flame AAS, and ICP Emission Spectroscopy, calibration procedures are formalized in SOPs. Procedures and frequencies for calibrating various field measuring instruments are given in Table 11.

Analysis of blank samples, duplicate samples, spiked blanks and matrix blanks will be performed where possible to document the effectiveness of calibration procedures. The frequency and type of these samples will be sufficient to verify the success of the calibration program.

Records of calibration, repair or replacement will be filed and maintained by the designated laboratory personnel performing QA activities. Calibration records of laboratories will be filed and maintained at the laboratory location where the work is performed and subject to QA audit.

5.7 PREVENTIVE MAINTENANCE

Equipment, instruments, tools, gauges and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedures developed by the operators.

Manufacturer's procedures identify the schedule for servicing critical items in order to minimize the downtime of the measurement system. It will be the responsibility of the operator to adhere to this maintenance schedule and to arrange any necessary and prompt service as required. Service to the equipment, instruments, tools, gauges, etc. will be performed by qualified personnel. In the absence of any manufacturer's recommended maintenance criteria, a maintenance procedure will be developed by the operator based upon experience and previous use of the equipment.

Logs will be established to record maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced will be reviewed, maintained and filed by the operators at the laboratories and by the data and sample control personnel when and if equipment, instruments, tools, and gauges are used at the sites.

Specific procedures regarding the preventative maintenance program for the GC, GC/MS and metal analytical equipment are contained in the laboratory's SOPs.

5.8 DATA REDUCTION, VALIDATION, AND REPORTING

All raw data pertaining to the project will be labeled as such and one copy will be submitted as a separate document with the final investigation report. When data are reduced, the method of reduction will be identified and described. The final report will also include, but not be limited to the following:

- Complete chain-of-custody record form
- Report data
- Method detection limits
- Method blank results
- Matrix spike results
- Duplicate results
- A presentation of the accuracy and precision data.

All raw data and calculations included in the final report will be checked by a person of proper technical expertise. A photocopy of each sheet of results or calculations will be made for checking. The checker will mark each correct calculation with a yellow felt pen. Errors will be identified with a red marker. The originator will then review the changes recommended by the checker. If the originator disagrees with the checker, the two will confer with one another until their differences are resolved.

5.9 CORRECTIVE ACTION PROCEDURES

A nonconformance is any event which is beyond the limits established for laboratory operation. Nonconformances can be due to data which fall outside accepted bounds for accuracy and precision, improper equipment calibration or maintenance, or improper data verification. Any activity in the laboratory which affects data quality can result in a nonconformance.

Nonconformances associated with the statistical analysis and review of data are straightforward to identify. The QCC will be responsible for the assessment of QA sample information. If data lie outside accepted limits, the QCC will immediately notify the Laboratory Manager and the responsible Group Leader. If the situation is not corrected so that an out-of-control condition occurs, or is expected to, the QCC will notify the Technical Director and the Laboratory Director. The Laboratory Manager and Group Leaders will be responsible for identifying the source of the nonconformance and initiating corrective action. Completion of corrective action will be evidenced by data returning to prescribed acceptable limits.

Nonconformances which do not readily result in an observed impact on data quality are more difficult to identify. Such events could be samples stored at an incorrect temperature or held beyond prescribed holding times or improper maintenance of records. Everyone in the laboratory will be responsible for reporting "system" nonconformances. Analysts will report nonconformances to their Group Leader, the Group Leaders in turn to the Laboratory Manager.

Corrective action will be the responsibility of the Laboratory Manager and the Group Leaders. They will review and approve the action taken.

Documentation of the nonconformance and the corrective action taken will be prepared if the nonconformance directly affects data quality. Documentation can be a memorandum to the project file if only one project is affected. If the effect of the nonconformance is general, the memorandum will be issued to the QCC and Laboratory Manager. Laboratory SOPs establish the procedures for identifying, documenting, and correcting nonconformances.

5.10 QUALITY ASSURANCE AUDITS AND REPORTS

To verify compliance with IT and specific project QA Program requirements, the IT QA Group shall perform planned and documented audits of project activities. These audits shall consist, as appropriate, of an evaluation of QA procedures and the effectiveness of their implementation, an evaluation of work areas and activities, and a review of project documentation. Audits shall be performed in accordance with written checklists by trained members of the QA Group and, as appropriate, technical specialists. Audit results shall be formally documented and sent to project management.

The audit will cover both field and laboratory activities and report preparation. The audit will be conducted by one or more of the following IT personnel:

- QA Director of ITAS-Laboratory Audit
- Corporate Director of QA Project Audit
- QA Manager - Milwaukee Office.

Audits may include, but not be limited to, the following areas:

- Field operations records
- Laboratory testing and records
- Equipment calibration and records
- Identification and control of samples
- Numerical analyses
- Computer program documentation and verification

- Transmittal of information
- Record control and retention.

Planned audits for this project will, as appropriate, cover the final reports. Unless significant QA problems arise, it is not anticipated that any separate reports will be issued. The final report will contain a separate QA section that summarizes the quality of the data collected during the project. Auditing will be performed in accordance with applicable requirements of the IT Engineering and Analytical Services QA Manuals.

6.0 HEALTH AND SAFETY PLAN

This Health and Safety Plan prescribes work place procedures which will be followed in order to protect any persons who may be potentially exposed to hazardous materials present at the site. The requirements listed may change as work progresses due to changing conditions, but no changes will be made without prior approval by the Health and Safety Coordinator. The program outlined is for IT and subcontractor personnel, and visitors, including facility and governmental representatives.

Based on the information currently available regarding the site, it is anticipated that the proposed site activities will be performed in Level D protective equipment. The Health and Safety Coordinator and Site Safety Officers will verify the adequacy of this level of protection and the necessity for work zones with on-site monitoring during the investigative activities.

6.1 PROJECT RESPONSIBILITIES

The following sections describe the health and safety responsibilities of project personnel.

6.1.1 Project Manager

The Project Manager is responsible for implementation of the Health and Safety Plan and appointment of a qualified Health and Safety Coordinator. His/her responsibilities include communicating the specific requirements to all personnel, conducting audits, and consulting with the Health and Safety Coordinator and his/her representatives regarding appropriate changes in safety and health requirements. The Project Manager also assumes specific responsibilities noted in the Emergency Contingency and Response Plan (Section 6.11).

6.1.2 Health and Safety Coordinator

The Health and Safety Coordinator will be responsible for the coordination of this plan. Only the Health and Safety Coordinator can change the provisions of this Plan. He/she, or one or more of his/her representatives, will be on site for the project start-up and as necessary thereafter to supervise the worker protection program. Liaison with the Project Manager, officers or representatives of the facility on matters relating to safety and health will be handled by the Health and Safety Coordinator and Site Safety Officers (SSOs). The authority of the Health and Safety Coordinator supersedes that of the Project Manager on health and safety issues.

6.1.3 Site Safety Officer

The designated SSO will:

- Supervise the day-to-day implementation of the site-specific health and safety program
- Train new site personnel on site specific health and safety items
- Interact with project personnel on health and safety matters
- Investigate and report accidents/incidents
- Maintain liaison between field activities, the Project Manager, and the Health and Safety Coordinator
- Perform air quality and personal monitoring as required
- Assist the Project Manager in enforcing the requirements of this manual and the site-specific program
- Complete all required forms on a timely basis.

6.1.4 Site Workers and Visitors

All facility employees, subcontractor, and regulatory personnel who may be exposed to the hazardous materials on-site are responsible for understanding and complying with the requirements of this plan, and must sign a statement that they have read, understood, and will abide by the plan. Failure to comply with this plan will result in disciplinary action, which could lead to removal from the site or termination.

Visitors will not be allowed to enter any Exclusion and Decontamination Zones (Section 6.6.1 and 6.6.2) unless they have: Completed the requirements for training (Section 6.2) and medical surveillance (Section 6.3); read and understood this Health and Safety Plan; and have permission of the Project Manager, the Health and Safety Coordinator and/or the Field SSO.

6.1.5 Record Keeping and Data Management

Proper record keeping and data management are essential in the implementation of this Health and Safety Plan. The forms associated with the record keeping and data management requirements must be completed in an accurate, timely fashion and filed with the appropriate entities. It is the responsibility of the Health and Safety Coordinator or the SSO to oversee that the forms are properly completed. Completed forms will be kept and maintained by IT for the required period of time. The subcontractors will also be responsible for keeping a copy of the forms pertaining to their personnel.

In addition, the Health and Safety Coordinator and/or SSO will keep daily logs and prepare weekly reports. Daily logs will include the following items:

- Date
- Activity description
- Area (site specific) checked
- Personnel in a particular area
- Equipment being utilized by personnel
- Protective clothing being worn by personnel
- Protective devices (including monitoring equipment) being used by personnel
- Signature and date.

An example of a daily log form is included in Figure 17.

Weekly reports will include the following items:

- Summary sheet covering the range of work done
- Any incidents of:

  -Nonuse of protective devices in an area where required
  -Nonuse of protective clothing
  -Disregard of buddy system
  -Violation of eating, smoking, and chewing in prohibited areas

- Instances of job-related injuries and illnesses
- Copies of the daily logs
- Signature and date.

6.2 TRAINING PROGRAM

This training program will be designed to address the requirements of OSHA Hazard Communication Standard (29 CFR 1910.1200), OSHA Hazardous Waste Operations and Emergency Response, Interim Final Rule (29 CFR 1910.120), and health and safety training required under RCRA.

6.2.1 Preproject Training

All IT employees and subcontractors who work on site shall have successfully completed a formal training program which shall include, at a minimum, the following items before they are permitted to enter the Exclusion or Decontamination zones:

- Basic Safety Training - This course shall stress fundamentals such as the cause and prevention of slip, trip, and fall hazards; safe lifting techniques; heat stress illnesses and their prevention.
- Hazard Protection - This course shall deal with the identification, recognition, and safe work procedures with toxic materials. The use and limitations of applicable protective clothing, and decontamination procedures are an important part of this course.
- First Aid and Cardiopulmonary Resuscitation (CPR) - A portion of employees will have completed the standard Red Cross First Aid and CPR courses.
- Health Hazard Awareness - Information shall be given concerning hazardous materials to which employees may be exposed. Information will include routes of exposure, toxic effects, appropriate protective equipment, medical surveillance, and the specific nature of the job which could result in exposure to hazardous materials.
- Work practices and engineering controls to minimize risk.
- Emergency Response Training - Procedures outlined in site emergency procedures are to be reviewed with all personnel.
- Hearing Conservation Program.

- Respirator Training - The use, limitations, and inspection of air purifying respirators, and SCBAs will be discussed. Proper decontamination procedures will also be covered. Respirator fit test will be given to all personnel consisting of qualitative fit test using irritant smoke in a plastic containment. Personnel shall breath normally and heavily, move their heads up and down and side to side, and talk while wearing the respirator in the smoke. Upon completion of this training, the employee will be asked to complete the form illustrated in Figure 21.

As noted in 29 CFR 1910.120 (e) (2) and (3), all IT employees and subcontractors, who are expected to enter the Exclusion and/or Decontamination Zones (Section 6.6.1 and 6.6.2, respectively) shall have received a minimum of 40 hours of initial off-site instruction. On-site supervisors shall complete at least eight additional hours of specialized training. However, 29CFR 1910.120 (e) (9) does provide that "employers who can show by an employee's work experience and/or training that the employee has had initial training equivalent to that training required in paragraphs (e) (1), (2), and (e) (3) of this section shall be considered as meeting the initial training requirements of these paragraphs. Equivalent training includes the training that existing employees might have already received from actual, on-site experience".

6.2.2 Initial On-Site Training

All personnel, prior to being allowed site access, will attend a training session conducted by the Health and Safety Coordinator/SSO that communicates the potential health and safety hazards on the site and instructs the individuals on the requirements of the Health and Safety Plan. This site-specific training will include the following items:

- Acute and chronic effects of the toxic chemicals identified at the site, including odors and conditions likely to indicate the presence of site-specific chemicals

- Physical health hazards identified at the site

- Personal hygiene

- Safety equipment, the procedures required for personnel protection, and their effectiveness and limitations

- Proper use and fitting of respirators

- Work areas established at the site
- Prohibitions in contaminated areas
- Change in site operations
- Buddy system
- Medical examinations
- Emergency procedures.

6.2.3 Safety Meetings

A safety meeting will be conducted at the beginning of each shift or whenever new IT employees or subcontractors arrive at the job site once the job begins. These meetings discuss the health and safety considerations for the day's activities and outline the necessary protective equipment. This meeting will be conducted by the Health and Safety Coordinator/SSO who will complete the Tailgate Safety Meeting form shown in Figure 22.

6.2.4 Training Records

All training that is conducted on site will be documented using the appropriate forms (Figures 21 and 22) and will be retained by IT. Forms covering subcontractor employment will also be forwarded to those organizations.

6.2.5 Material Safety Data Sheets

Completed material safety data sheets (MSDS) forms or their equivalent shall be posted at conspicuous locations on the job site for the toxic materials that may be encountered during the study.

6.3 MEDICAL SURVEILLANCE

Personnel will utilize the services of an approved medical clinic to provide and/or review medical examinations and conduct surveillance compliant with the guidance herein. The name of the clinic and evidence of passing an examination for all subcontractor personnel that are expected to enter exclusion or decontamination areas shall be provided to IT by the subcontractors prior to personnel working on the site.

6.3.1 Physical Examinations

All personnel that work in any Exclusion or Decontamination Zones will have received a preemployment physical examination with a yearly update examination. The examination will include:

- Medical and occupational history and physical examinations (including a history of respiratory disease)
- Complete blood count and differential
- Urinalysis (dip stick and microscopic)
- SMA-20 or equivalent
- Audiometric examination
- Chest X-ray (14 x 17 posterior/anterior view)
- Pulmonary function test (FVC and FEV 1.0)
- EKG for employees over 45 years of age or when there is an indication of problem
- Vision acuity and color
- Drug and alcohol screen (optional)
- Any other tests deemed appropriate based on site hazards.

The chest X-ray may be omitted for personnel who have had one within the past year.

The physical examination will be performed at an approved clinic and/or results of the physical will be reviewed by an IT appointed consulting physician. This physician medically approves/disapproves the employee for work with hazardous materials. Any physical activity that should be restricted based on the physician's evaluation is noted on the proper form (Figure 23).

6.3.2 Injury and Illness Treatment

Any employee who is suspected of having an over exposure to the chemicals on site will be given a complete physical examination. A clinic selected and/or approved by IT is to provide this service as well as to treat injuries that occur on the job that are not handled at the site as first aid or treated as an emergency hospital visit. The clinic's physician will certify that the employee is fit to return to work before his/her employment on site can continue. Any physical activity that should be restricted based on the physician's evaluation is to be noted on the proper form (Figure 23).

In the event of any injury or accident, a "Supervisor's Employee Injury Report" (Figure 24) shall be completed as soon as practical by a supervisor after the event. This shall be reviewed by the Project Manager and the Health and Safety Coordinator/SSO.

6.3.3 Medical Records

All medical surveillance records shall be maintained for a period of 30 years by IT and the subcontractors, and shall be available as required by state and/or local regulations; namely 29 CFR 1910.20 (a)-(e) and (g)-(i).

6.4 AIR MONITORING AND PERMISSIBLE EXPOSURE LIMITS

6.4.1 Air Monitoring

Depending on the work to be completed, continuous or periodic daily air monitoring by qualified personnel is required with the photoionization detector, HNu (10.2 lamp), and/or flame ionization detector (organic vapor analyzer-OVA). Continuous air monitoring shall be performed during all drilling in source and near source areas. Daily monitoring levels shall be recorded on a form such as the Real Time Air Monitoring Log (Figure 25) for each work location. Periodic monitoring shall also be conducted during other activities such as well sampling. Monitoring for flammable/oxygen deficient atmospheres is to be conducted using a MSA 260, GasTech 1314, or equivalent combustible gas/oxygen meter, at the direction of the Health and Safety Coordinator/SSO.

Where hydrogen cyanide (HCN) gas is of concern to personnel, a MDA Computer Model 4100 HCN monitor will be utilized. This monitoring device may be attached directly to site personnel to monitor worker exposure during the various work functions or used for area monitoring purposes. The HCN monitor is set to alarm at a HCN concentration of 10 ppm. In addition, this instrument has the following cross sensitivities and will alarm at the 10 ppm set point:

	CONCENTRATION IN AIR	METER READOUT
H_2S	2 ppm	10 ppm
Chlorine	10 ppm	5 ppm
HCl	10 ppm	7 ppm
Phosgene	10 ppm	5 ppm

Draeger Tubes will be kept on site to measure airborne concentrations of such compounds as HCN, mercury vapor and trichloroethene, at the direction of the Health and Safety Coordinator/SSO.

It will be the responsibility of the Health and Safety Coordinator/SSO to define the proper monitoring effort prior to the commencement of the work activity. Based on the results of the air monitoring, the Health and Safety Coordinator has the authority to upgrade or downgrade the level of protection.

Monitoring equipment shall be cleaned after each work shift. The instruments shall also be checked to note if they are functioning properly prior to each shift's start-up. The equipment will be calibrated at defined time intervals and a calibration log shall be kept up-to-date.

6.4.2 Permissible Exposure Limits

The following action levels are typically designated for work to be conducted at various sites:

- Based on OVA and HNu readings for VOC contaminants, action levels are recommended as:
  - Level D: Background to 5 ppm at breathing zone
  - Level C: Readings 5-20 ppm above background in breathing zone for five minutes
  - Any breathing zone level beyond 20 ppm above background for five minutes or more will require Level B protection or withdrawal from the site. The Health and Safety Coordinator will be advised of the situation.
- The combustible gas meter/oxygen analyzer will be set to alarm at 10% of the lower explosive limit (LEL) and at oxygen levels below 20%. Conditions which exceed limits will require Level B protection or withdrawal from the area until conditions improve and the Health and Safety Coordinator will be notified.

- The Threshold Limit Value for HCN is 10 parts per million (ppm). If this limit is exceeded, Level B protection is required. HCN concentrations of 50 ppm or greater are considered immediately dangerous to life and health (IDLH), and will require withdrawal from the area and notification of the Health and Safety Coordinator.

6.5 PERSONNEL PROTECTION EQUIPMENT

6.5.1 Levels of Protection

Personal protective equipment must be compatible with and provide protection against the chemical compounds identified on site. The selection of protective equipment and clothing shall be in accordance with the work activity and hazardous/toxic vapor concentrations. Personnel protective equipment shall provide respiratory, skin, head, foot, and eye protection for personnel operating in the designated exclusion and contamination reduction zones. Respiratory equipment shall be Mine Safety and Health Administration (MSHA)/National Institute of Occupational Safety and Health (NIOSH) certified. Generally, the projected work to be conducted at sites appear to require levels of protection ranging from Level D, Level C, and Level B. The Health and Safety Coordinator is responsible for designating the appropriate level of protection for each activity.

6.5.1.1 Level D

Level D protection should be worn only as a work uniform and not in any work area with respiratory or skin hazards. Meeting any of the following criteria allows the use of Level D protection: no contaminants are present; and work functions preclude splashes, immersion, or potential for unexpected inhalation of any chemicals.

Personnel protective equipment includes:

- Coveralls or work uniform
- Gloves*
- Boots/shoes, leather or chemical-resistant, steel toe and shank
- Outer boots, chemical-resistant (disposable)*
- Safety glasses or chemical splash goggles*
- Hard hat
- Escape mask*
- Hearing protection*
- Face shield*.

  *Optional, as applicable

6.5.1.2 Level C

Level C protective equipment should be worn when the concentration(s) and type(s) of airborne substance(s) are known and the criteria for using air purifying respirators are met. These criteria include:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV) and the concentration is within the service limit of the canister/cartridge.
- Atmospheric contaminant concentrations do not exceed IDLH levels.
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus (SCBA).
- Direct readings are above background on instruments such as the HNu or OVA (Section 6.4.2).

Level C equipment includes:

- Air-purifying respirator, full-face, canister/cartridge-equipped (MSHA/NIOSH approved)
- Chemical-resistant clothing (hooded, one-piece or two-piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls)
- Coveralls*
- Gloves (outer), chemical-resistant
- Gloves (inner), chemical-resistant*
- Boots (outer), chemical-resistant steel toe and shank
- Boots covers, chemical-resistant (disposable)*
- Hard hat (face shield*)
- Escape mask*

- Hearing protection*

- 2-Way radio communications* (inherently safe).

  *Optional

6.5.1.3 Level B

Level B provides the highest level of respiratory protection that is necessary, but a lesser level of skin protection. Level B protection should be used when:

- The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection.

- The atmosphere contains less than 19.5 percent oxygen.

- The presence of incompletely identified vapors or gases is indicated by an OVA or HNu, but these vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through intact skin.

Components of Level B protection include:

- Pressure-demand, full facepiece self-contained breathing apparatus (SCBA), or equivalent (NIOSH approved)

- Hooded chemical-resistant clothing, coveralls, one-piece or two piece chemical splash suit; disposable chemical - resistant coveralls

- Coveralls*

- Gloves, outer, chemical resistant

- Gloves, inner, chemical resistant

- Boots (outer) chemical resistant steel toe and shank

- Boot-covers, chemical resistant (disposable)

- Hard hat (face shield*)

- 2-Way radio communications*

- Hearing protection*

- Escape mask*.

  *Optional

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be better identified. It is the responsibility of the Health and Safety Coordinator to prescribe levels of protection in these situations.

6.5.2 Respiratory Protection

Respiratory equipment utilization and equipment on site shall conform to 20 CFR 1910.134 requirements, and specifically with regards to maintenance, inspection, fit testing, and usage. The requirements of the American Standards Institute (ANSI) 200.2, Practice for Respiratory Protection, will also be followed.

The following respiratory protection program for Level C shall be followed:

- Air-purifying cartridges shall be replaced at the end of each shift or if breakthrough or load up occurs.
- Only employees who have had preissue qualitative fit tests, and annual fit tests thereafter, shall be allowed to work in atmospheres where respirators are required.
- If an employee has demonstrated difficulty in breathing during the fit test or during use, he or she shall have a physical examination to determine whether the employee can wear a respirator while performing the required duty.
- No employee shall be assigned to tasks requiring the use of respirators if, based on the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the health and safety of the employee or other employees will be impaired by use of a respirator.
- The employee shall be permitted to change cartridges whenever an increase in breathing resistance is detected.
- Beards and other facial obstructions which prevent a seal between the face and respirator will not be allowed.
- Each respiratory facepiece shall be individually assigned and not interchanged between workers without cleaning and sanitizing. Contact lenses are not to be worn with respirators.
- A procedure shall be established for ensuring daily cleaning, maintenance, and changeout of canister/cartridges, in the event respirator use becomes required.

6.6 WORK ZONES

The following discussion of work zones relates primarily to source or near source areas. Less stringent work zones will be established in areas not suspected to contain contamination. Other work activities including sampling that occur in source areas shall also follow the work zone procedure outlined below.

Regulated areas will be established within the job site to control the indiscriminate dispersion of contamination around the work area and to minimize personnel exposures and equipment contamination. Access to these controlled areas will be restricted to those designated employees who are qualified in accordance with the Health and Safety Plan to perform hazardous materials work, who are properly attired in the required personal protective equipment, and have received authorization from the Project Manager and the Health and Safety Coordinator/SSO.

Three distinct control zones will be used to regulate the job site: Exclusion Zone, Decontamination Zone, and Support Zone.

6.6.1 Exclusion Zone

This zone includes the actual areas of contamination and has the highest inhalation and skin exposure potential to chemicals on site. The Exclusion Zone will be delineated with stakes and hazard tape.

6.6.2 Decontamination Zone

This zone includes the areas immediately surrounding the Exclusion Zone. This shall occur at the interfaces of the Exclusion Zone and the Support Zone and shall provide for the decontamination of equipment and personnel before crossing into the Support Zone.

6.6.3 Support Zone

This zone covers all areas outside of the Decontamination Zone. This area is considered to have no significant air, water, or soil contamination. The Support Zone provides a changing area for personnel entering the Decontamination and Exclusion Zones.

The Health and Safety Coordinator shall clearly define and mark work zones in and around the site and shall specify equipment, operations, and personnel requirements within these areas.

6.7 DECONTAMINATION PROCEDURES

6.7.1 Personnel Decontamination

All personnel working within the Exclusion Zone will be required to pass through a decontamination station to remove and/or wash off their protective equipment and clothing before they are permitted to enter the noncontaminated support areas of the job site. A decontamination corridor, consisting of plastic-lined containers and buckets of soap and water solutions will be placed in a linear manner within the Decontamination Zone. The decontamination process will require that all personnel exiting the Exclusion Zone step into the decontamination corridor and complete the following decontamination steps:

- Wash and rinse/dispose outersuit, respirator, gloves, and boots
- Untape mask, ankles, and wrist
- Remove outersuit, gloves, boot covers, and hard hat
- Wash and rinse inner gloves and boots
- Remove respirator, inner gloves, and inner boots
- Remove inner clothing in decontamination trailer, shower (or wash hands and face), and redress
- Exit into the Support Zone.

This procedure may be modified depending on site conditions.

If Level B conditions exist, the SCBA will be disconnected from the regulator at the upwind (identified by a flag or wind sock) edge of the Exclusion Zone. Personnel will then connect to an air purifying canister that is MSHA/NIOSH approved in order to move through the Decontamination Zone and initial decontamination procedures.

Reusable outersuits will be scrubbed down with detergent and rinsed for reuse before each break and at the end of each shift. Disposable outersuits will be properly discarded after the initial rinsing. New outer gloves and boot covers will be worn after each break.

The break area will be in the Decontamination Zone next to the shower trailer (if provided). All outer protective equipment shall be decontaminated before removal for a break. Drinking will be permitted in this area only after hands and face have been washed. Eating and smoking is only permitted in the Support Zone. Depending on the work involved, showers may be required by all personnel working in Level B and C prior to entering the Support Zone.

6.7.2 Equipment Decontamination

All equipment used in the remediation operations on site shall be cleaned in the decontamination area before removal to the Support Zone. Protective equipment such as respirator facepieces will be decontaminated at the end of the shift. Heavy equipment will be transported to and steam cleaned on a decontamination pad before removal to the Support Zone. Monitoring equipment, e.g., HNu meter, HCN monitor, etc., will be protected from contamination to the extent practical by plastic bags. Exposed parts will be cleaned with wet cloths and alcohol wipes.

It is the responsibility of the SSO to make sure all pieces of heavy equipment coming off-site are properly decontaminated, according to the procedures outlined above. Documentation of decontamination must be made in the field log notebook that will then become part of the permanent project file. The equipment number must be written in the field log notebook when the equipment is decontaminated and goes off-site with a notation that proper procedures have been followed.

6.7.3 Waste Disposal

Disposable protective clothing, APR cartridges and decontamination solution will be contained, bagged, labeled and secured for proper disposal, and disposed of according to applicable state and federal regulations. Amphenol Corporation will be responsible for the disposal of all wastes generated.

6.8 GENERAL WORK PRACTICES

The following work practices will be adhered to during the project.

- Contaminated (Exclusion and Decontamination) zones as established on the site shall be observed. Entry into the contaminated zones shall be by prior notification and authorization of the Project Manager/Health and Safety Coordinator/SSO who established the zone. All required protective clothing shall be worn prior to entering a contaminated zones.

- Contaminated protective equipment, such as respirators, hoses, boots, etc., shall not be removed from the regulated area until it has been properly cleaned, packaged and labeled.

- Legible and understandable precautionary labels shall be affixed prominently to containers of contaminated scrap, waste, debris, and clothing.

- Contaminated materials shall be stored in tightly-closed containers in well-ventilated areas.

- Containers shall be moved only with the proper equipment and shall be secured to prevent dropping or loss of control during transport.

- No food or beverages shall be present or consumed in the regulated area.

- No tobacco products shall be present or used, and cosmetics shall not be applied in the regulated area.

- Emergency equipment shall be located outside storage areas in readily accessible locations which will remain minimally contaminated in an emergency.

- All areas that have been determined as uncontaminated inside the regulated areas will be clearly marked as such. No personnel, equipment, etc., shall be in these areas until they have been decontaminated.

- Personnel on site shall use the "buddy" system (pairs). Buddies should prearrange hand signals for communication in case of a lack of radios or radio breakdown. Communication or visual contact shall be maintained between crew members at all times.

- Field personnel must observe each other for signs of toxic exposure. Indications of adverse effects include, but are not limited to:

  1. Changes in complexion and skin discoloration
  2. Changes in coordination
  3. Changes in demeanor
  4. Excessive salivation and pupillary response
  5. Changes in speech pattern.

- Field personnel shall be cautioned to inform each other of nonvisual effects of toxic exposure such as:

  1. Headaches
  2. Dizziness
  3. Nausea
  4. Blurred vision
  5. Cramps
  6. Irritation of eyes, skin, or respiratory tract.

  Any detected effects of toxic exposure shall be reported to the SSO immediately.

- An emergency eyewash unit shall be located immediately adjacent to employees who handle hazardous or corrosive materials.

- If any on-site activities, including decontamination, continue later than dusk, adequate lighting must be provided. No work is to be conducted in storms.

- Enter work site upwind (as possible) from visible contamination; this area should be marked by flagging. Practice contamination avoidance.

6.9 HEAT STRESS

The Health and Safety Coordinator/SSO shall continuously visually monitor all personnel to note for signs of heat stress. In addition, all field personnel will be instructed to observe for symptoms of heat stress and methods on how to control it. One or more of the following control measures can be used to help control heat stress:

- Provision of adequate liquids to replace lost body fluids. Employees must replace water and salt lost from sweating. Employees must be encouraged to drink more than the amount required to satisfy thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.

- Replacement fluids can be a 0.1 percent salt water solution, commercial mixes such as Gatorade or Quick Kick, or a combination of these with fresh water. Employees should be encouraged to salt their foods more heavily.

- Establishment of a work regime that will provide adequate rest periods for cooling down. This may require additional shifts of workers.

- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments.

- All breaks are to be taken in a cool rest area (77 degrees Fahrenheit is best).

- Employees shall remove impermeable protective garments during rest periods.

- Employees shall not be assigned other tasks during rest periods.

- All employees shall be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress.

The heat stress of employees on site may be monitored by the Wet Bulb Globe Temperature Index (WBGT) technique. This method will require the use of a heat stress monitoring device, such as the Wibget Heat Stress Monitor (Reuter Stokes).

The WBGT shall be compared to the Threshold Limit Values (TLV) outlined in the ACGIH TLV's Manual, and a work-rest regime established, as necessary, according to the WBGT obtained. Note that 3 degrees Celsius must be subtracted from the TLV's for heat stress listed to compensate for the wearing of impermeable protective clothing.

6.10 EMERGENCY CONTINGENCY AND RESPONSE

The Health and Safety Plan has been established to allow site operations to be conducted in a manner to minimize hazardous health impacts on employee and community health and safety. In addition, this Emergency Contingency and Response (ECR) section has been developed to cover extraordinary conditions that might occur at the site.

All accidents and unusual events will be dealt with in a manner to minimize health risk to site workers and the surrounding community. In the event of an accident or other unusual event, the following procedures will be followed:

- First aid and other appropriate initial action will be administered by properly trained personnel closest to the incident. This assistance will be conducted in a manner to assure that those rendering assistance are not placed in a situation of unacceptable risk.

- All incidents will be reported to and documented by the designated Emergency Coordinator, who is responsible for coordinating the emergency response in an efficient, rapid, and safe manner. The

Emergency Coordinator will decide if off-site assistance, medical treatment, or both is required and arrange for such assistance. The Emergency Coordinator will ensure that adequate emergency equipment will be available on site.

- All workers on site are responsible to conduct themselves in a mature, calm manner in the event of an accident or unusual event. All personnel must conduct themselves in a manner to avoid spreading danger to themselves, surrounding workers, or the community in general.

The site Project Manager or designee will assist site security during activation of the ECR.

6.10.1 Responsibilities

6.10.1.1 Emergency Coordinator

The site Project Manager is responsible for field implementation of the ECR, and will designate the person/persons to be Site Emergency Coordinator. This person has training and experience in emergency response. As the Emergency Coordinator, specific duties include:

- Communicating site ECR requirements to all personnel, whether directly involved in emergency response or not
- Specifying a backup alternate (most likely the Health and Safety Coordinator/SSO)
- Purchasing supplies as necessary
- Controlling activities of subcontractors and respond to outside agencies
- Anticipating, identifying, assessing, and controlling fires, explosions, chemical releases, and other emergency situations.

6.10.1.2 Safety Coordinator (Health and Safety Coordinator/SSO)

The Health and Safety Coordinator is responsible for:

- Establishing health and safety procedures
- Conducting preproject training
- Directing the SSO
- Monitoring during project start-up.

He/she will make advance arrangements with appropriate support groups and alert them to the site hazards and types of emergencies that may arise. As the Safety Coordinator, specific duties include:

- Provide a map of the site location and define the ingress routes
- Determining response time and adequacy of emergency support services
- Identifying backup medical and emergency facilities
- Providing training and information about hazards on site and special handling procedures
- Establishing personal contact with each designated agency. This includes on-site training for appropriate response agencies. Table 16 contains a list of off-site support agencies and groups.

6.10.1.3 Personnel and Subcontractors

All on-site personnel, whether involved in emergency response or not, will be notified of their responsibilities in an emergency. They will be familiar with the ECR and the Emergency Coordinator's authority.

The ECR teams will be trained in decontamination, response, rescue, and hazard containment. These teams will be American Red Cross-certified (or equivalent) in cardiopulmonary resuscitation (CPR) and emergency first aid.

6.10.2 Emergency Equipment

In the event of an emergency, equipment will be available to rescue and treat victims, protect response personnel, and mitigate hazardous conditions on site.

6.10.2.1 Personal Protection

Personal protective equipment may include:

- Neoprene boots
- Sijal Guardian suits
- Tyvek suits - polyethylene coated and uncoated
- Neoprene and nitrile gloves

- Face shields and goggles
- Self-contained breathing apparatus (SCBA)
- Full-face chemical cartridge respirators with cartridges for organic vapors and dust.

6.10.2.2 Medical

Emergency first aid equipment may include:

- Splints
- Antiseptics
- Blankets
- Decontamination solutions appropriate for on-site chemical hazards
- Emergency eye wash
- Emergency showers or wash stations
- Cold packs
- Reference books containing basic first aid procedures and information on treatment of specific chemical injuries
- Stretchers
- Water, in portable containers
- Emetic agent to induce vomiting
- Antibacterial ointments
- Bandage materials.

6.10.2.3 Hazard Mitigation

Hazard mitigation equipment may include:

- Containers to hold contaminated materials
- Shovels - wooden handle, steel type. This equipment, also stored in a spill control equipment locker, is to be used in the physical containment of any released hazardous constituents.

6.10.3 Communication and Notification

6.10.3.1 Communications

The primary communication system will rely on telephone communications. Personnel will be familiar with protocol for contacting support groups and agencies identified in the ECR. Emergency numbers will be placed in company vehicles and at strategic locations throughout the site. Hand signals or radios will be used as a backup should telephone communications fail.

6.10.3.2 Assembly Area and Emergency Services Maps

A site evacuation area will be designated before job start-up and will be located upwind of the prevailing wind. Here, emergency needs will be provided such as:

- Assembly for evacuated site personnel
- First aid for injured personnel
- Decontamination material
- Communications.

An emergency services route map will be prepared and located in company vehicles, posted with the emergency number list on site, and distributed to support groups and agencies for:

- Local hospital
- Local medical clinic
- City police department
- Fire department.

All maps will be used in training sessions and in emergency response planning. Practice "runs" will be made along all emergency service routes by supervisory personnel.

6.10.3.3 Notification

If the Emergency Coordinator determines that the site has an uncontrolled situation such as a spill, fire, or explosion which could threaten public health or the environment, he/she will report his findings as follows:

- Alert site personnel via telephone.

- If his/her assessment indicates that evacuation of the work area may be advisable, he/she will immediately initiate the evacuation notice, stop the operation, and notify one person from each organization of the appropriate authorities listed in Table 18. He/she will be available to help appropriate officials decide whether adjacent areas should be evacuated.

- In the event normal communication lines fail, a backup communication system will be activated. This system (e.g., a Citizen's Band radio or mobile telephone) will be able to access the appropriate emergency service providers.

The notification report will be made from the site trailer (if available) to the appropriate support groups and will include:

- Description of incident (e.g., release, fire)

- Name and telephone number of reporter

- Name and address of incident

- Name and quantity of materials or material involved to the extent known

- The extent of injuries, if any

- The possible hazards to human health or the environment, and cleanup procedures

- Assistance that is requested.

6.10.4 Emergency Procedures

Potential incidents fall under four general classifications: (1) fire or explosions; (2) chemical releases to the atmosphere, soil, or surface waters; (3) severe weather conditions such as tornado and lightning storms; and (4) worker injury or illnesses. The following sequence of events constitute the specific responses and control procedures to be taken in the event of these four incident scenarios.

The initial response to any emergency will be to protect human health and safety, and then the environment. Secondary response to the emergency will be identification, containment, treatment, and disposal assessment.

6.10.4.1 Hazard Assessment

The Emergency Coordinator in consultation with the Health and Safety Coordinator/SSO will assess possible hazards to human health or the environment that may result from the chemical release, fire, explosion, or severe weather conditions. The Emergency Coordinator will assess the hazards posed by an incident through the following steps, as appropriate:

- Assess immediate need to protect human health and safety
- Identify the materials involved in the incident
- Identify exposure and/or release pathways and the quantities of materials involved
- Determine the potential effects of exposure/release, and appropriate safety precautions.

This assessment will consider both the direct and indirect effects of the chemical release, fire, explosion, or severe weather conditions (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire and heat-induced explosions).

Based on this assessment, the Emergency Coordinator will determine what risks are posed to site personnel and community populations. If the incident cannot be controlled by operating personnel without incurring undue risk, the Emergency Coordinator will order the evacuation of all workers at risk and notify appropriate parties listed in Table 18 of the situation and the assistance required. If the Emergency Coordinator determines that any persons outside the site are at risk as a result of the incident, he will contact the appropriate agencies and departments listed in Table 18 and advise them of the risk and the need or potential need to institute off-site evacuation procedures.

6.10.4.2 Fire and Explosion

When fire or explosion appear imminent or have occurred, all remediation activities will cease.

The Emergency Coordinator will assess the severity of the situation and decide whether the emergency event is or is not readily controllable with existing fire suppression equipment on hand. Firefighting will not be done if the risk to operating personnel appears high. The Fire Department will be called in all situations in which fires or explosions have occurred.

If the situation appears uncontrollable, and poses a direct threat to human life or the environment, a warning will be administered to all personnel to secure their emergency equipment. If the chances of an impending explosion are high, the entire site will be evacuated.

The Emergency Coordinator will alert all personnel when all danger has passed, as determined by the Fire Department.

Situations which will activate notification of other emergency contacts are:

- A fire causes or could cause the release of toxic fumes
- The fire spreads and could possibly ignite nearby fuel oil or other liquid wastes, or could cause heat-induced explosions
- The fire could possibly spread to off-site areas
- Use of fire extinguishers and suppressants does not result in fire containment
- An imminent danger exists that an explosion could occur, causing a safety or health hazard
- An imminent danger exists that an explosion could ignite other hazardous waste at the facility
- An imminent danger exists that an explosion could result in release of toxic materials
- An explosion has occurred.

6.10.4.3 Chemical Release

If a chemical release resulting in probable vapor cloud is noted, the information will be immediately relayed to the Emergency Coordinator. The Emergency Coordinator in consultation with the Health and Safety Coordinator/SSO will assess the magnitude and potential seriousness of the release by reviewing the following information:

- Material safety data sheets (MSDS) for the material released
- Source of the release
- An estimate of the quantity released and the rate at which it is being released
- The direction in which the air release is moving
- Personnel who may be or may have been in contact with material, or air release, and possible injury or sickness as a result
- Potential for fire or explosion resulting from the situation
- Estimates of area under influence of release.

If the release is determined to lie within the on-site emergency response capabilities, the Emergency Coordinator will implement the necessary remedial action.

If the incident results in chemical concentrations at the site perimeter exceeding the action levels specified in the Health and Safety Plan, the Emergency Coordinator will notify the appropriate support agencies. The Emergency Coordinator may elect to make immediate notification if conditions warrant. In the event of an emergency release, all personnel not involved with emergency response activity will be evacuated from the immediate area.

MSDS forms will be consulted in the event of a chemical release to air, land, or water.

6.10.4.4 Natural Disaster

When a tornado warning has been issued or when a lightning storm occurs (within a five-mile radius of the site), the information will be immediately relayed to the Emergency Coordinator in the Support Area and all personnel shall standby for emergency procedures. In the case of a tornado siting, personnel shall institute shutdown procedures and lie down in a depression. When a storm passes, the Emergency Coordinator will inspect all of the on-site equipment to ensure its readiness for operation. If any equipment has been damaged, the work will not be restarted until the equipment has been repaired or replaced.

If the Emergency Coordinator's inspection indicates a fire, explosion, or release has occurred as the result of a severe weather condition, he will follow the appropriate procedures in Sections 6.10.4.2 or 6.10.4.3.

6.10.4.5 Security

During activation of the ECR, the Emergency Coordinator or his designated representative, will control access to the site and maintain a security incident log which will include:

- Time of entry
- Expected exit time
- Use of team or "buddy" system
- Task being performed
- Location of task
- Rescue and response equipment used
- Protective equipment being used.

6.10.4.6 Medical Treatment/Accident

Selected on-site emergency personnel will be trained:

- In on-the-spot first aid and CPR treatment techniques
- To establish contact with medical experts
- To establish liaisons with local emergency response support agencies.

Program elements will include as a minimum:

- Establishing liaison with local medical personnel, for example: contracted physician, medical specialists, local hospitals, ambulance service, and poison control center. Inform and educate these personnel about site-specific hazards so that they can be optimally helpful if an emergency occurs. Develop procedures for contacting them; familiarize all on-site emergency personnel with these procedures.

- Setting up on-site emergency first aid stations and providing that these stations are well supplied and restocked immediately after each emergency.

6.10.4.7 Follow-up and Reentry

Before normal operations are resumed, the Emergency Coordinator will see that another emergency can be handled by:

- Assuring all appropriate notifications were made
- Restocking all equipment and supplies
- Clean, refuel, and repair all additional equipment
- Review and revise all aspects of the ECR.

In addition, the Emergency Coordinator will verify that ambient concentrations of toxic chemicals are below limits generally recognized as safe.

6.10.5 TRAINING

In addition to the preproject training outlined in the Health and Safety Plan, specific emergency response training will:

- Relate directly to site-specific, anticipated situations
- Be repeated often in "tailgate" sessions
- Provide for an evacuation drill
- Ensure that training records are maintained.

Visitors will be briefed on basic emergency procedures such as decontamination, emergency signals, and evacuation routes.

Personnel without defined emergency response roles (e.g., state and federal agency representatives) must still receive a level of training that includes at a minimum:

- Hazard recognition

- Standard operating procedures

- Signaling an emergency: the signals used, how to summon help, what information to give and who to give it to

- Evacuation routes and assembly area

- The person or station to report to when the ECR is activated.

Personnel involved with remediation activities will have a thorough understanding of the ECR. Training will be directly related to their specific roles and will include:

- Emergency chain-of-command
- Communication methods and signals
- How to call for help
- Emergency equipment and its use
- Emergency evacuation while wearing protective equipment.

7.0 PROJECT MANAGEMENT

This section describes the management procedures that will be implemented to assure that the project is completed with quality products, on schedule and within budget. Overall monitoring of the schedule and budget will be the responsibility of the Project Manager and will be accomplished by communication with the project staff and by review of accounting department reports.

IT utilizes a computer base system for controlling costs on a real time basis. Within this system, schedule and cost control will be maintained through the use of a Work Breakdown Structure (WBS). The WBS provides a method for immediate comparison of planned and actual time and cost for labor and expense, on a site-by-site, phase-by-phase and task-by-task basis. The WBS will be updated on a weekly basis using data contained on various input forms, including time sheets. The WBS will form an integral component of monthly reports to Amphenol, indicating project status on the basis of work effort versus projected cost and schedule.

7.1 STAFF

Successful completion of the facility investigation will necessitate the integration of a skilled team of technical experts and management personnel. IT will provide a highly skilled and experienced team consisting of personnel experienced in facility investigations and remediation work at the site. The proposed project team has the following characteristics:

- Project director and project manager with demonstrated technical expertise and management experience with facility investigation and remediation activities,

- Task managers, skilled within the scope of their phase, who maintain consistent quality, assign resources and provide project wide coordination for each phase,

- A highly skilled professional and consulting support staff who are well-acquainted with the issues at facility investigations dealing with hydrogeologic studies, and

- A mechanism for independent review and advisory assistance for health and safety, and quality assurance/quality control.

We believe that the project team and organization developed for this project assures Amphenol of the highest possible caliber of personnel and a management structure that will provide for the cost-effective and timely completion of the project.

The project team is illustrated in Figure 26. Brief descriptions of key personnel are as follows:

Project Director - Brian P. Borofka

Mr. Borofka has over 14 years of experience in overseeing environmental investigations for industrial facilities. This has included several facility assessments and remedial design studies under CERCLA/SARA and RCRA. Consequently, Mr. Borofka is aware of the specific agency needs and regulatory requirements necessary to implement timely and cost-effective programs that result in the continued protection of human health and the environment.

Project Manager - Susan Tituskin

Ms. Susan Tituskin has had extensive experience in the realm of managing facility investigations. Ms. Tituskin has participated in a variety of facility investigation projects ranging from Superfund sites in Michigan, Minnesota, and Illinois, to private industry sites in Minnesota, Illinois, Indiana, Michigan, and Wisconsin. With over 5 years experience, Ms. Tituskin is capable of implementing an in-depth investigation.

Health and Safety Officer - Stephen Illes

Mr. Illes will be assigned as the Health and Safety Officer to implement IT health and safety policies uniformly throughout the program. By reporting directly to the Director of Health and Safety, he will have sufficient authority to provide an independent assessment of the appropriateness of the safety precautions.

7.2 REPORTING AND SCHEDULE

The results of this investigation will be used to determine the need for and the extent of appropriate future actions. The appropriate actions will be developed after analytical data from this investigation has been evaluated to determine:

- The nature and extent of contamination,

- The potential threat to the public health, welfare, or the environment.

A report will be prepared at the conclusion of this investigation. The report will detail the activities performed and the results obtained. The report will also provide a Level II Public Health Evaluation of the data obtained during the investigation, and provide recommendations for appropriate future actions, if any, at the site.

The report will be submitted in draft form for review by Amphenol. A meeting will be scheduled three weeks after the draft report has been submitted to receive comments from Amphenol. Following receipt of the review comments, the report will be finalized and resubmitted to Amphenol.

Based upon IT's previous experience, we believe that this project can be completed in 30 weeks. Table 19 presents a list of anticipated time frames for the various tasks of the project. Assumptions made during the formulation of the anticipated time frames are:

- The zero start date for the project is the date of approval of this plan.

- U.S. EPA and State personnel will be given four weeks to review the Draft Facility Investigation Report.

- The Technical Work Plan portion (Section 4.0) of this plan will not be substantially changed by the regulatory agencies.

8.0 BIBLIOGRAPHY

ATEC Associates, Inc., Hydrogeologic Investigation, May 17, 1984.

ATEC Associates, Inc., Plating Room Investigation, October 24, 1984.

Hill, R. H., 1976, Environmental Geologic Maps for Land Use Evaluations in Johnson County, Indiana, Indiana Geological Survey Occasional Paper 18.

IT Corporation, Site Assessment, Revised Final Report, August 1985.

Schneider, A. F., 1966, Physiography, Indiana Academy of Science Report.

Shaver, R. H., et al., 1970, Compendium of Rock-Unit Stratigraphy in Indiana, Indiana Geological Survey Bulletin No. 43.

Uhl, J. E., 1966, Water Resources of Johnson County with Emphasis on Ground Water Availability, Indiana Department of Natural Resources, Division of Water.

Wayne, W. J., 1963, Pleistocene Formations in Indiana, Indiana Geological Survey Bulletin No. 25.

Wayne, W. J., 1966, Ice and Land, A Review of the Tertiary and Pleistocene History of Indiana, Indiana Academy of Science Reprint.

Johnson County Soil Survey, 1979, United States Department of Agriculture Soil Conservation Service.

TABLE 1
PLATING ROOM INVESTIGATION SAMPLE RESULTS
AMPHENOL CORPORATION
FRANKLIN, INDIANA

HA No.	Depth, ft	Benzene ppb	Chloro-benzene ppb	Chloroform ppb	1,1-Dichloro-ethene ppb	1,2-Dichloro-propane ppb	Ethyl-benzene ppb	Fluorotri-chloromethane ppb	Methylene Chloride ppb	Tetrachloro-ethene ppb	Toluene ppb	1,1,1-Trichloro-ethane ppb	Trichloro-ethene ppb	Total Cyanide ppm	Cyanide Reactive ppm	pH
1	0.5 - 1.0	29	ND	ND	ND	ND	ND	ND	180	735	25	ND	780	2.5	-	9.8
	1.5 - 2.0	ND	21	ND	ND	ND	35	ND	130	850	ND	ND	1,000	0.8	-	9.0
2	0.5 - 1.0	ND	19	ND	ND	ND	83	ND	ND	36,300	46	ND	880	266	-	6.7
	1.5 - 2.0	76	ND	ND	ND	ND	85	ND	ND	400	22	ND	530	60	-	
3	0.5 - 1.0	-	-	-	-	-	-	-	-	-	-	-	-	10	-	9.0
	1.0 - 1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-
	1.5 - 2.0	-	-	-	-	-	-	-	-	-	-	-	-	0.4	-	9.0
	2.0 - 2.5	ND	ND	ND	ND	ND	ND	ND	ND	400	ND	ND	ND	-	-	-
	3.5 - 5.0	ND	ND	ND	ND	ND	ND	ND	ND	160	ND	ND	ND	.96	-	7.0
4	0.5 - 1.0	-	-	-	-	-	-	-	-	-	-	-	-	21	-	9.0
	1.0 - 1.5	ND	ND	ND	ND	ND	ND	ND	ND	2,100	ND	ND	2,100	-	-	-
	1.5 - 2.0	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	6.0
	2.0 - 2.5	ND	ND	ND	ND	ND	ND	ND	ND	390	ND	150	170	-	-	-
5	0.5 - 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9	-	5.0
	4.0 - 4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42	-	6.0
6	1.5 - 2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	-	5.0
	2.0 - 2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	-	6.0
	4.0 - 4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19	-	6,0
7	0.5 - 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	-	8.0
	1.5 - 2.0	-	-	-	-	-	-	-	-	-	-	-	ND	0.16	-	6.0
	2.0 - 2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	290	-	-	-
	4.0 - 4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	80	.47	-	5.5
8	0.5 - 1.0	ND	3	ND	970	ND	ND	ND	ND	870	ND	30	6	2.6	-	7.5
	2.5 - 3.0	ND	ND	57,000	ND	ND	ND	ND	ND	275,000	ND	89,000	63,000	1.8		6.5
	4.5 - 5.0	ND	ND	23,000	ND	ND	ND	ND	ND	19,000	ND	69,000	38,000	3.0		7.0
9	0.5 - 1.0													2.4	-	7.5
10	0.5 - 1.0	ND	ND	ND	ND	ND	ND	ND	ND	2,070	ND	3	112	450	5.5	9.0
	2.5 - 3.0	ND	ND	ND	ND	ND	ND	ND	ND	400	ND	35	ND	12	2.8	8.0
	4.5 - 5.0	ND	ND	ND	ND	ND	ND	ND	ND	170	ND	ND	29	0.41	-	7.0

ND = Not detectable at the concentrations noted by the laboratory

TABLE 1
PLATING ROOM INVESTIGATION SAMPLE RESULTS
AMPHENOL CORPORATION
FRANKLIN, INDIANA

HA No.	Depth, ft	Benzene ppb	Chloro-benzene ppb	Chloroform ppb	1,1-Dichloro-ethene ppb	1,2-Dichloro-propane ppb	Ethyl-benzene ppb	Fluorotri-chloromethane ppb	Methylene Chloride ppb	Tetrachloro-ethene ppb	Toluene ppb	1,1,1-Trichloro-ethane ppb	Trichloro-ethene ppb	Total Cyanide ppm	Cyanide Reactive ppm	pH
11	0.5 - 1.0	ND	ND	30	2	ND	ND	56	168	2,060	ND	76	550	8.2	-	8.5
	2.5 - 3.0	ND	ND	37	6	2	ND	50	188	2,600	ND	188	2,400	8.7	-	7.5
	4.5 - 5.0	ND	ND	ND	ND	ND	ND	ND	ND	2,470	ND	8	524	5.0	-	7.0
12	0.5 - 1.0	ND	ND	6	ND	ND	ND	19	12	997	ND	19	195	3.2	-	6.5
	2.5 - 3.0	ND	ND	14	9	ND	ND	51	96	2,520	ND	281	2,150	<0.1	-	6.5
	4.5 - 5.0	ND	ND	24	8	ND	ND	68	158	2,600	ND	110	2,080	1.3	-	6.5
13	0.5 - 1.0													0.76	-	8.0
	2.5 - 3.0													1.3	-	7.5
	4.5 - 5.0													1.2	-	6.5
14	0.5 - 1.0													580	-	
	2.5 - 3.0													12	-	
	4.5 - 5.0													120	-	
15	0.5 - 1.0	ND	ND	ND	ND	ND	ND	ND	ND	2,600	ND	22	361	3.8	-	7.0
	2.5 - 3.0	ND	ND	ND	ND	ND	ND	ND	ND	2,500	ND	5	ND*	48	<1	7.0
	4.5 - 5.0	ND	ND	ND	ND	ND	ND	ND	ND	2,690	ND	103	547	64	1.0	8.0
16	0.5 - 1.0	ND	ND	ND	ND	ND	ND	ND	ND	502	ND	30	127	1.1	-	7.0
	2.5 - 3.0	ND	ND	ND	ND	ND	ND	ND	ND	472	ND	17	233	<0.1	-	6.5
	4.5 - 5.0	ND	ND	ND	ND	ND	ND	ND	ND	825	ND	28	203	16	<1	7.5
17	0.5 - 1.0													0.69	-	10.0
	2.5 - 3.0													4.6	-	7.0
	4.5 - 5.0													3.0	-	6.5
18	0.5 - 1.0													4.6	-	9.0
	2.5 - 3.0													6.2	-	8.0
	4.5 - 5.0													0.17	-	6.5
19	0.5 - 1.0													22	<1	5.5
	2.5 - 3.0													3.7	-	6.0
	4.5 - 5.0													2.8	-	6.5
20	0.5 - 1.0													<0.1	-	7.0
	2.5 - 3.0													2.8	-	7.0
	4.5 - 5.0													0.35	-	7.0

ND = Not detectable at the concentrations noted by the laboratory

* = Result may be in error due to interference

TABLE 1
PLATING ROOM INVESTIGATION SAMPLE RESULTS
AMPHENOL CORPORATION
FRANKLIN, INDIANA

HA No.	Depth, ft	Benzene ppb	Chlorobenzene ppb	Chloroform ppb	1,1-Dichloroethene ppb	1,2-Dichloropropane ppb	Ethylbenzene ppb	Fluorotrichloromethane ppb	Methylene Chloride ppb	Tetrachloroethene ppb	Toluene ppb	1,1,1-Trichloroethane ppb	Trichloroethene ppb	Total Cyanide ppm	Cyanide Reactive ppm	pH
21	0.5 - 1.0													<0.1	-	7.0
	2.5 - 3.0													0.4	-	7.0
	4.5 - 5.0													0.8	-	7.0
22	0.5 - 1.0													<0.1	-	7.0
	2.5 - 3.0													5.6	-	6.5
	4.5 - 5.0													0.6	-	6.5
23	0.5 - 1.0													0.82	-	7.5
	2.5 - 3.0													0.92	-	6.5
	4.5 - 5.0													0.20	-	6.5
24	0.5 - 1.0													<0.1	-	9.5
	2.5 - 3.0													4.2	-	6.5
	4.5 - 5.0													2.7	-	6.5
25	0.5 - 1.0													<0.1	-	7.0
	2.5 - 3.0													1.0	-	6.5
26	0.5 - 1.0													1.2	-	7.0
	2.5 - 3.0													0.67	-	6.5
	4.5 - 5.0													1.1	-	7.0
27	0.5 - 1.0													0.53	-	7.5
	2.5 - 3.0													0.11	-	6.5
	4.5 - 5.0													1.3	-	6.0
28	0.5 - 1.0													<0.1	-	8.0
	2.5 - 3.0													0.92	-	6.5
	4.5 - 5.0													0.86	-	6.5
29	0.5 - 1.0													0.12	-	7.5
	2.5 - 3.0													0.78	-	6.5
	4.5 - 5.0													0.39	-	6.0

ND = Not detectable at the concentrations noted by the laboratory

TABLE 1
PLATING ROOM INVESTIGATION SAMPLE RESULTS
AMPHENOL CORPORATION
FRANKLIN, INDIANA
PAGE 4 OF 4

HA No.	Depth, ft	Benzene ppb	Chloro-benzene ppb	Chloroform ppb	1,1-Dichloro-ethene ppb	1,2-Dichloro-propane ppb	Ethyl-benzene ppb	Fluorotri-chloromethane ppb	Methylene Chloride ppb	Tetrachloro-ethene ppb	Toluene ppb	1,1,1-Trichloro-ethane ppb	Trichloro-ethene ppb	POX ppb	Total Cyanide ppm	Cyanide Reactive ppm	pH
30	0.5 - 1.0														<0.1	-	9.0
	2.5 - 3.0														1.9	-	7.0
	4.5 - 5.0														1.1	-	7.0
31	0.5 - 1.0														0.11	-	7.0
	2.5 - 3.0														0.66	-	6.5
	4.5 - 5.0														0.44	-	6.5
32	0.5 - 1.0														450	-	
	2.5 - 3.0														610	-	
	4.5 - 5.0														18	-	

ND = Not detectable at the concentrations noted by the laboratory

Note: From Plating Room Investigation, Atec Associates, Inc., 1984

TABLE 2

SHALLOW SOIL SAMPLING ANALYTICAL RESULTS

AMPHENOL CORPORATION

FRANKLIN, INDIANA

PARAMETER	CAS NUMBER[1]	SAMPLE IDENTIFICATION B-1	B-2	B-5	B-6
		Concentration ug/ℓ[2]			
Acrolein	107-02-8	<100	<100	<100	<100
Acrylonitrile	107-13-1	<100	<100	<100	<100
Benzene	71-43-2	<10	<10	12	24
Bromoform	75-25-2	<10	<10	<10	<10
Carbon Tetrachloride	56-23-5	<10	<10	<10	<10
Chlorobenzene	108-90-7	<10	<10	<10	<10
Chlorodibromomethane	124-48-1	<10	<10	<10	<10
Chloroethane	75-00-3	<10	<10	<10	<10
2-Chloroethylvinyl ether	110-75-8	<100	<100	<100	<100
Chloroform	67-66-3	290	38	<10	15
Dichlorobromomethane	75-27-4	<10	<10	<10	<10
Dichlorodifluoromethane	75-71-8	<100	<100	<100	<100
1,1-Dichloroethane	75-34-3	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	<10	<10	<10	<10
1,1-Dichloroethylene	75-35-4	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	<10	<10	<10	<10
1,3-Dichloropropylene[3]	542-75-6	<10	<10	<10	<10
Ethylbenzene	100-41-4	<10	<10	<10	<10
Methyl bromide	74-83-9	<100	<100	<100	<100
Methyl chloride	74-87-3	<100	<100	<100	<100
Methylene chloride	75-09-2	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	<10	<10	<10	<10
Tetrachloroethylene	127-18-4	370	78	<10	<10
Toluene	108-88-3	<10	<10	<10	<10
trans-1,2-Dichloroethylene	156-60-5	<10	<10	<10	<10
1,1,1-Trichloroethane	71-55-6	140	220	58	<10
1,1,2-Trichloroethane	79-00-5	<10	<10	<10	<10
Trichloroethylene	79-01-6	1,000	460	53	<10
Trichlorofluoromethane	75-69-4	<10	<10	<10	<10
Vinyl Chloride	75-01-4	<100	<100	<100	<100

TABLE 2

SHALLOW SOIL SAMPLING ANALYTICAL RESULTS

AMPHENOL CORPORATION

FRANKLIN, INDIANA

(CONTINUED)

PARAMETER	CAS NUMBER(1)	SAMPLE IDENTIFICATION B-9	B-10	B-14	B-15
		Concentration µg/ℓ(2)			
Acrolein	107-02-8	<100	<100	<100	<100
Acrylonitrile	107-13-1	<100	<100	<100	<100
Benzene	71-43-2	25	18	<10	<10
Bromoform	75-25-2	<10	<10	<10	<10
Carbon Tetrachloride	56-23-5	<10	<10	<10	<10
Chlorobenzene	108-90-7	<10	<10	<10	<10
Chlorodibromomethane	124-48-1	<10	<10	<10	<10
Chloroethane	75-00-3	<10	<10	<10	<10
2-Chloroethylvinyl ether	110-75-8	<100	<100	<100	<100
Chloroform	67-66-3	<10	<10	<10	<10
Dichlorobromomethane	75-27-4	<10	<10	<10	<10
Dichlorodifluoromethane	75-71-8	<100	<100	<100	<100
1,1-Dichloroethane	75-34-3	<10	<10	<10	<10
1,2-Dichloroethane	107-06-2	<10	<10	<10	<10
1,1-Dichloroethylene	75-35-4	<10	<10	<10	<10
1,2-Dichloropropane	78-87-5	<10	<10	<10	<10
1,3-Dichloropropylene(3)	542-75-6	<10	<10	<10	<10
Ethylbenzene	100-41-4	<10	<10	<10	<10
Methyl bromide	74-83-9	<100	<100	<100	<100
Methyl chloride	74-87-3	<100	<100	<100	<100
Methylene chloride	75-09-2	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	<10	<10	<10	11
Tetrachloroethylene	127-18-4	37	27	220	460
Toluene	108-88-3	<10	<10	<10	<10
trans-1,2-Dichloroethylene	156-60-5	<10	<10	<10	<10
1,1,1-Trichloroethane	71-55-6	36	24	<10	<10
1,1,2-Trichloroethane	79-00-5	<10	<10	<10	<10
Trichloroethylene	79-01-6	59	41	140	320
Trichlorofluoromethane	75-69-4	<10	<10	<10	<10
Vinyl Chloride	75-01-4	<100	<100	<100	<100

TABLE 2

SHALLOW SOIL SAMPLING ANALYTICAL RESULTS

AMPHENOL CORPORATION

FRANKLIN, INDIANA

(CONTINUED)

PARAMETER	CAS NUMBER[1]	SAMPLE IDENTIFICATION B-25	B-26	B-27
		Concentration µg/ℓ[2]		
Acrolein	107-02-8	<100	<100/<100[4]	<100
Acrylonitrile	107-13-1	<100	<100/<100	<100
Benzene	71-43-2	<10	<10/<10	<10
Bromoform	75-25-2	<10	<10/<10	<10
Carbon Tetrachloride	56-23-5	<10	<10/<10	<10
Chlorobenzene	108-90-7	<10	<10/<10	<10
Chlorodibromomethane	124-48-1	<10	<10/<10	<10
Chloroethane	75-00-3	<10	<10/<10	<10
2-Chloroethylvinyl ether	110-75-8	<100	<100/<100	<100
Chloroform	67-66-3	<10	<10/<10	<10
Dichlorobromomethane	75-27-4	<10	<10/<10	<10
Dichlorodifluoromethane	75-71-8	<100	<100/<100	<100
1,1-Dichloroethane	75-34-3	<10	<10/<10	<10
1,2-Dichloroethane	107-06-2	<10	<10/<10	<10
1,1-Dichloroethylene	75-35-4	<10	<10/<10	<10
1,2-Dichloropropane	78-87-5	<10	<10/<10	<10
1,3-Dichloropropylene[3]	542-75-6	<10	<10/<10	<10
Ethylbenzene	100-41-4	<10	<10/<10	<10
Methyl bromide	74-83-9	<100	<100/<100	<100
Methyl chloride	74-87-3	<100	<100/<100	<100
Methylene chloride	75-09-2	<10	<10/<10	<10
1,1,2,2-Tetrachloroethane	79-34-5	<10	<10/<10	<10
Tetrachloroethylene	127-18-4	160	450/170	140
Toluene	108-88-3	<10	<10/<10	<10
trans-1,2-Dichloroethylene	156-60-5	<10	<10/<10	<10
1,1,1-Trichloroethane	71-55-6	<10	21/<10	<10
1,1,2-Trichloroethane	79-00-5	<10	<10/<10	<10
Trichloroethylene	79-01-6	56	350/130	120
Trichlorofluoromethane	75-69-4	<10	<10/<10	<10
Vinyl Chloride	75-01-4	<100	<100/<100	<100

TABLE 2

SHALLOW SOIL SAMPLING ANALYTICAL RESULTS

AMPHENOL CORPORATION

FRANKLIN, INDIANA

(CONTINUED)

(1) The numbers presented in this column are the Chemical Abstracts Service (CAS) numbers used for cataloging the indicated compounds in the Chemical Abstracts Index.

(2) $\mu g/\ell$ = micrograms per liter or parts per billion.

(3) The indicated compound is incorrectly identified in Part C of NPDES Form 2C as 1,2-Dichloropropylene. However, the sample was screened for the presence of both compounds.

(4) The indicated sample was analyzed in duplicate.

TABLE 2

SHALLOW SOIL SAMPLING ANALYTICAL RESULTS

AMPHENOL CORPORATION

FRANKLIN, INDIANA

(CONTINUED)

PARAMETERS	CAS NUMBER[1]	SAMPLE IDENTIFICATION B-1	B-2	B-5	B-6	B-9	B-10
		Concentration)g/P[2]					
Acetone	67-64-1	830	<100	<100	<100	<100	<100
2-Butanone	78-93-3	<100	<100	<100	<100	<100	<100
Carbon disulfide	75-15-0	<10	<10	<10	<10	<10	<10
2-Hexanone	591-78-6	<100	<100	<100	<100	<100	<100
4-Methyl-2-pentanone	108-10-1	<100	<100	<100	<100	<100	<100
Styrene	100-42-5	<10	<10	<10	<10	<10	<10
Vinyl acetate	108-05-4	<100	<100	<100	<100	<100	<100
o-Xylene	95-47-6	<10	<10	<10	<10	<10	<10

TABLE 2

SHALLOW SOIL SAMPLING ANALYTICAL RESULTS

AMPHENOL CORPORATION

FRANKLIN, INDIANA

(CONTINUED)

PARAMETERS	CAS NUMBER[1]	SAMPLE IDENTIFICATION B-14	B-15	B-25	B-26	B-27
		Concentration µg/ℓ[2]				
Acetone	67-64-1	<100	<100	<100	<100<100[3]	<100
2-Butanone	78-93-3	<100	<100	<100	<100/<100	<100
Carbon disulfide	75-15-0	<10	<10	<10	<10/<10	<10
2-Hexanone	591-78-6	<100	<100	<100	<100/<100	<100
4-Methyl-2-pentanone	108-10-1	<100	<100	<100	<100/<100	<100
Styrene	100-42-5	<10	<10	<10	<10/<10	<10
Vinyl acetate	108-05-4	<100	<100	<100	<100/<100	<100
o-Xylene	95-47-6	<10	<10	<10	<10/<10	<10

(1) The numbers presented in this column are the Chemical Abstracts Service (CAS) numbers used for cataloging the indicated compounds in the Chemical Abstracts Index.

(2) µg/ℓ = micrograms per liter or parts per billion.

(3) The indicated sample was analyzed in duplicate.

TABLE 3
QUARTERLY MONITORING RESULTS, 1986
Amphenol Corporation
Franklin, Indiana

CONCENTRATION ug/l *

COMPOUND / Well Number	IT-1				IT-2				IT-3				MW-3			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Benzene							1.2	1.0			1.0	1.0			2.0	
1,1-Dichloroethane		3.7		1.1	15	10	11	34	13	10	7.5	7.9		1.0		1.6
1,2-Dichloroethane	12					3.6			19	11			8.8	5.2	24	
1,1-Dichloroethylene					1.6		29		5.3	1.9	38	2.3	1.5		4.1	
Tetrachloroethylene	1.2	21	49	77	1.5	7.5	38	55	290		24	16	10000	12000	11000	6000
Trans-1,2-Dichloroethylne	1.0							51	1.4			1.0	2.4		8.9	3.9
1,1,1-Trichloroethane		5.2			90	64	120	39	190	200	150	160	88	100		87
Trichloroethylene		4.0	26	55	88	93	120	130	67	27	50	72	14000	8000	9700	9200
Acetone				12												
Dichlorobromethane																
Chloroform	3.2															
Methylene Choloride	54														61	
Carbon Disulfide																
2-butane																
Styrene	2.3															

* mu/l = micrograms per liter or parts per billion.

TABLE 3
QUARTERLY MONITORING RESULTS, 1986
(Continued)
Amphenol Corporation
Franklin, Indiana

		CONCENTRATION ug/l *											
	Well Number	MW-9				MW-12				OUTFALL			
COMPOUND	Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Benzene								1.3					
1,1-Dichloroethane		1.3				360	280	310	440		4.4		4.1
1,2-Dichloroethane		4.3				1600	1400		6.2	3.1	15		
1,1-Dichloroethylene				8.8		180	120	3000	200		1.0	35	1.1
Tetrachloroethylene		220	18			17000	34000	18000	26000	58	1500	96	23
Trans-1,2-Dichloroethylene						5.9		5.6	6.7				
1,1,1-Trichloroethane	, 2 mg/l	42	30	30	32	19000	25000	9600	24000	31	720	69	89
Trichloroethylene		40	24	6.6	5.0	7400	5400	6100	9100	120	850	200	190
							66,000		60,000				
Acetone					170								
Dichlorobromethane										1.4			
Chloroform						2.9							
Methyelene Chloride													
Carbon Disulfide		1.4											
2-Butanone	? 2-Butane?					13							
Styrene													

* mu/l = micrograms per liter or parts per billion.

TABLE 4
HURRICANE CREEK STREAM FLOW DATA
AMPHENOL CORPORATION
FRANKLIN, INDIANA

Drainage Area	15.64 sq. miles
Q100	4000 cfs
Q50	3400 cfs
Q25	2800 cfs
Q10	2100 cfs
1-Day Mean Low Flow (10-year Recurrence)	0.0 cfs
3-Day Mean Low Flow (10-year Recurrence)	0.0 cfs
7-Day Mean Low Flow (10-year Recurrence)	0.0 cfs
7-Day Mean Low Flow (2-year Recurrence)	0.0 cfs

Note: Discharge information courtesy of Indiana Department of Natural Resources Surface Water Section.

Mean Low Flow information courtesy of U.S. Department of Interior, Geological Survery, Water Resources Division.

TABLE 5
NUMBERS AND TYPES OF SAMPLES
TO BE COLLECTED DURING THE SITE INVESTIGATION
AMPHENOL CORPORATION

TASK	NUMBER OF INVESTIGATIVE SAMPLES	SAMPLE TYPE	ANALYTICAL PARAMETERS
Soil Vapor Investigation	0	---	---
Soil Boring Sampling			
Borings Near Cyanide Tank (2)	6	Grab	(a)(b)
Borings Near Lapping Compound Tanks (2)	6	Grab	(b)
All Other Borings (9)	27	Grab	(a)(b)(c)
Total	39		
Monitoring Well Sampling	12	Grab	(a)(b)(c)
Surface Water Sampling	5	Grab/Composite(1)(2)	(a)(b)(d)
Sediment Sampling	5	Grab/Composite(1)(2)	(a)(b)(c)

(a)Total and amenable cyanide
(b)Volatile organic compounds (VOCs).
(c)Hazardous Substance List metals.
(d)Field Dissolved Oxygen

(1)Whether the samples collected is a composite depends on the sampling location (see Section 4.4)

(2)The number of subsamples which are composited into one composite sample will be determined in the field by the Sampling Team Leader.

TABLE 6
SAMPLE BOTTLE AND PRESERVATION REQUIREMENTS
FOR WATER SAMPLES
AMPHENOL CORPORATION

ANALYTICAL PARAMETERS	SAMPLE BOTTLE[1]	SAMPLE PRESERVATIVE	SAMPLE HOLDING TIME
Volatiles (VOCs)	Two 40-ml glass VOC vials	Cool to 4 °C No headspace	10 days after sample collection
Metals (exc. Hg)	One 500-ml plastic bottle	Filter, HN03 to pH <2 Cool to 4 °C	6 months
Mercury	One 125-ml glass bottle	Filter, HN03 to pH <2 Cool to 4 °C	26 days
Total Cyanide*	One 1-liter plastic bottle	NaOH to pH >12 Cool to 4 °C	14 days after sample collection
Amenable Cyanide*	One 1-liter plastic bottle	NaOH to pH >12 Cool to 4 °C	14 days after sample collection

(1)Does not include QA samples.

*To be analyzed from ground water samples only.

TABLE 7
SAMPLE BOTTLE AND PRESERVATION REQUIREMENTS
FOR SOIL AND SEDIMENT SAMPLES
AMPHENOL CORPORATION

ANALTYICAL PARAMETERS	SAMPLE BOTTLE[1]	SAMPLE PRESERVATIVE	SAMPLE HOLDING TIME
Volatiles (VOCs)	One 4-ounce amber glass bottle with teflon liner	Cool to 4°C No headspace	10 days after sample collection
Metals (exc. Hg)	One 500-ml plastic bottle	None	6 months
Mercury	One 500-ml glass bottle	None	26 days
Total Cyanide	One 500-ml glass bottle	Cool to 4°C	14 days after sample collection
Amenable Cyanide	One 500-ml glass bottle	Cool to 4°C	14 days after sample collection

[1] Does not include QA samples.

TABLE 8
ANALYTICAL PARAMETERS, METHODS, SAMPLE VOLUMES
AND DETECTION LIMITS
AMPHENOL CORPORATION

PARAMETER	METHOD	VOLUME(1)	DETECTION LIMIT(2)
Volatiles (VOCs)			
Surface Water/Ground Water	CLP SOW 7/87	5 ml	See Table 8
Soil/Sediment	CLP SOW 7/87	5 g	See Table 8
Metals (ICP) (exc. Hg)			
Surface Water/Ground Water	CLP SOW 7/87	100 ml	See Table 9
Soil/Sediment	CLP SOW 7/87	2 g	See Table 9
Mercury			
Surface Water/Ground Water	CLP SOW 7/87	100 ml	See Table 9
Soil/Sediment	CLP SOW 7/87	100 g	See Table 9
Total Cyanide			
Surface Water/Ground Water	CLP SOW 7/87	500 ml	See Table 9
Soil/Sediment	CLP SOW 7/87	5 g	See Table 9
Amenable Cyanide			
Surface Water/Ground Water	335.1 (3)	500 ml	See Table 9
Soil/Sedement	9010 (4)	5 g	See Table 9

N/A = Not applicable.

(1)Does not take into account any amount for QA samples.

(2)May not be attainable due to sample matrix and/or interferences.

(3)Methods for the Chemical Analysis of Water and Waste; U.S. EPA 600/4-71-020, 1983 Revision.

(4)Test Methods for Evaluating Solid Waste, SW846, 3rd Edition, 9/86, U.S. EPA.

TABLE 9
VOLATILE ORGANIC COMPOUNDS (VOCS) AND
THEIR DETECTION LIMITS IN SOIL AND WATER
AMPHENOL CORPORATION

PARAMETER	DETECTION LIMITS[1]	
	SOIL (ng/g)[2]	WATER (ug/l)
Benzene	5	5
Bromoform	5	5
Carbon Tetrachloride	5	5
Chlorobenzene	5	5
Chlorodibromomethane	5	5
Chloroethane	10	10
Chloroform	5	5
Dichlorobromomethane	5	5
1,1-Dichloroethane	5	5
1,2-Dichloroethane	5	5
1,1-Dichloroethylene	5	5
1,2-Dichloropropane	5	5
1,3-cis-Dichloropropylene	5	5
1,3-trans-Dichloropropylene	5	5
Ethylbenzene	5	5
Methyl Bromide	10	10
Methyl Chloride	10	10
Methylene Chloride	5	5
1,1,2,2-Tetrachloroethane	5	5
Tetrachloroethylene	5	5
Toluene	5	5
1,2-Dichloroethene (Total)	5	5
1,1,1-Trichloroethane	5	5
1,1,2-Trichloroethane	5	5
Trichloroethylene	5	5
Vinyl Chloride	10	10
Styrene	5	5
Acetone	10	10
2-Butanone	10	10
2-Hexanone	10	10
4-Methyl-2-Pentanone	10	10
Vinyl Acetate	10	10
Carbon Disulfide	5	5
Xylenes (Total)	5	5

(1) Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable.

(2) Detection limits listed for soil/sediment are based on wet weight. The detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, will be higher.

TABLE 10
METAL DETECTION LIMITS
AMPHENOL CORPORATION

ANALYTE	CLP REQUIRED DETECTION LIMIT[1] WATER (μg/l)	SOIL/SEDIMENT (μg/kg)[2]
Aluminum	200	20,000
Antimony	60	6,000
Arsenic	10	1,000
Barium	200	20,000
Beryllium	5	500
Cadmium	5	500
Calcium	5,000	500,000
Chromium	10	1,000
Cobalt	50	5,000
Copper	25	2,500
Iron	100	10,000
Lead	5	500
Magnesium	5,000	500,000
Manganese	15	1,500
Mercury	0.2	20
Nickel	40	4,000
Potassium	5,000	500,000
Selenium	5	500
Silver	10	1,000
Sodium	5,000	500,000
Thallium	10	1,000
Vanadium	50	5,000
Zinc	20	2,000
Total Cyanide	0.01	1
Amenable Cyanide (3)	0.01	1

(1) May not be attainable due to sample matrix and/or interferences.
(2) Not corrected for dry weight basis.
(3) Not a CLP parameter; method listed on Table 7.

TABLE 11
FIELD SAMPLING EQUIPMENT,
MANUFACTURERS, CALIBRATION FREQUENCIES AND PROCEDURES*
AMPHENOL CORPORATION

Instrument	Manufacturer	Calibration Procedure	Frequency
Ph Meter-Hydac	Cambridge Scientific Industries	As specified by the manufacturer	Prior to each shift or break
Conductivity Meter-Hydac	Cambridge Scientific Industries	As specified by the manufacturer	Prior to each shift or break
Thermometer-Hydac	Cambridge Scientific Industries	As specified by the manufacturer	Factory set
HNu-PI101	HNu System, Inc.	As specified by the manufacturer	Start of day's activities and as needed during the day
OVA-108	Foxboro	As specified by the manufacturer	In-house calibration every 6 mos.; field check at start of day's activities and as needed during the day
Photovac TIPI	Photovac, Inc.	As specified by the manufacturer	Start of day's activities and as needed during the day
M-scope	Brainard-Kilman	As specified by the manufacturer	Twelve months

* Operations manuals will be kept on site with the field sampling equipment.

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
GAS CHROMATOGRAPHY SECTION
AMPHENOL CORPORATION

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
Gas Chromatograph, Perkin Elmer Sigma 300	007311900053
Autosampler, Perkin Elmer AS300	2424-1282
Integrator, Hewlett Packard 3390A	2149A07440
Gas Chromatograph, Perkin Elmer Sigma 300	1006315100104
Autosampler, Perkin Elmer AS300	3364-584
Integrator, Hewlett Packard 3392A	2439A03943
Gas Chromatograph, Perkin Elmer Sigma 300	009344900114
Autosampler, Perkin Elmer AS300	3707-1084
Integrator, Hewlett Packard 3392A	2450A05325
Gas Chromatograph, Hewlett Packard 5880	2224A0273
Integrator, Hewlett Packard 5880A	2205A03497
Purge Trap Sampler, Hewlett Packard 7675A	2229A00779
Gas Chromatograph, Perkin Elmer, Sigma 300	002239300065
Autosampler, Perkin Elmer AS300	3979-285
Integrator, Hewlett-Packard, 3393A	2532A00262
Gas Chromatograph, Hewlett Packard 5790	2203A00156
Integrator, Hewlett Packard 3390A	2149A10430
Wrist Action Shaker, Burrell #75	NA
2 Chromatography Interface Modules	6106751019
Nelson Analytical Model 760	698750994
2 Sonic Dismembrators, Fisher Scientific	2261
Model 300 2138	
Chromatography Data Station, Perkin Elmer Sigma 1	851558003
Interface, Perkin Elmer AS-100	104335
Control Kit, Perkin Elmer AS-100	
Gas Chromatograph, Perkin Elmer Sigma 1	81558003
Autosampler, Perkin Elmer Model AS100	1695-381

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
GAS CHROMATOGRAPHY SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
Gas Chromatograph, Hewlett-Packard, 5890A	2518A05180
Integrator, Hewlett-Packard, 3392A	2519A06906
Controller, Hewlett-Packard, 7673A	2510A00429
Tek Mar Liquid Sampler (LSC-2)	749
Gas Chromatograph, Tracor Model 540 Hall/PID Detectors	861514
Integrator, Spectra-Physics SP4290	SP4290
Integrator, Spectra-Physics SP4270	SP4270
Solvent Delivery System, Model 510	510-129082
Solvent Delivery System, Model 510	510-129075
Variable Wavelength Detector	481-005773
Interface Module Detector	SIM-005110
Gas Chromatograph, Perkin-Elmer AS-8500 (w/ECD/FID)	044759006056
Autosampler, Perkin-Elmer AS-300	N484-1710
Graphic Printer, GP-100	062992
Labconco Dishwasher	NA
Sears Kenmore Trash Compactor	D60819710
Sears Kenmore Refrigerator	1-320-002
Zero Headspace Extractor, Assoc. Design & Mfg.	NA
Zero Headspace Extractor, Assoc. Design & Mfg.	NA
Zero Headspace Extractor, Millipore	NA
Zero Headspace Extractor, Millipore	NA

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
GC/MS SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
Printronix 300 LPM Printer	A61832
OWA Model 1020B Automated GC/MS	13337-1184
4500 Cipher-Magnetic Tape Drive	13335-0984
Purge & Trap Sampler, Tekmar LSC-2 4200 Automated Heated Sampler	740
Refrigerator, Whirlpool	E61446166
Video Terminal, Finnigan	NA
Finnigan Keyboard	NA
OWA Model 1020C Automated GC/MS Terminal Finnigan	13993-0986
Purge & Trap Sampler, Tekmar ALS	2086
Autosampler, Tekmar ALS-1	972
Video Terminal, Finnigan	NA
Finnigan Keyboard	145438
Mettler Balance Model AE200	NA
Finnigan 4530B GC/MS/DS	13335-0984
Video Terminal, Finnigan Graphon	10152139
Printronix Printer	A67477
Autosampler, Varian 8000	947923SE85-04
Video Terminal, Finnigan MAT	1015/3094
Finnigan Keyboard	152859
Personal Computer IBM-AT	57706038634
Keyboard IBM-AT	263190959
Color Monitor	108540
Printer, Epson LQ-1000	03006911
Data General NOVA 4X Computer	13335-0984
Data General Nova 4X Computer	13472-0885
Finnigan 4530 GC/MS/DS	13472-0885
Video Terminal, Finnigan MAT	101511960
Finnigan Keyboard	105967
Printronix Printer	A92911

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
GC/MS SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER
Avanti Refrigerator #6
Avanti Refrigerator #7
Whirlpool Refrigerator #5
Frigidaire Refrigerator #2
Printonix 300 LPM Printer
Sartorius Balance 2003MP1
Incos 50 MS with Printronix Printer
Tekmar Model 4200 Automated Heated Sampler
Tekmar Model 4000 Purge & Trap
Data General Computer
Data General Cartridge Tape Drive
Varian GC

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
GENERAL CHEMISTRY SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
Computer Aided Titrimeter, Fisher	
Multisampler, Model 489	197
Titration Burette, Model No. 455	626
Electrode Washer, Model No. 540	136
Titration Stirrer, Model No. 460	566
Printer Plotter, Model No. 465	473
UV/VIS Spectrophotometer, Perkin-Elmer Lambda 3	36824
Lambda 3 Safe Memory Accessory, Perkin Elmer	35449
B&L UV/VIS Spectrophotometer, Model 1001	0715497
ph Meter, Orion 407A	24218
pH Meter/BOD Probe, Orion 501	40044
Specific Ion Meter, Orion 901	94789
Conductivity Meter, YSI 32	705
Turbidimeter AF DRT-100D	15853
National Sterile-Quick Autoclave	NA
Infrared Spectrophotometer-Perkin Elmer Model 1310	133931
Perkin Elmer Model 1310	
pH Meter Orion 701	43242
MGW Lauda Waterbath M20 MT	E39043
Buch Ratavapor R110	870066
Buchler Thermo 1 ft	78918
Mettler Balance PC4400	828727

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
GENERAL CHEMISTRY SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
Lachat	
OKIDATA Microline Printer 182	612B0315340
Thomson color Monitor 4120	35084
Computer 17983	
Random Access Sample	126006
Peristolic Pump	125352
Hot Water Bath Model 80	126009
Detector Head	125215
Fisher Isotemp Oven 200 Series	577
Fisher Isotemp Oven 411	138
Blue M Oven OV18A	RPA-8005
Perkin Elmer Spectrophotometer 54B	R2067
DI Water Still	NA

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
GEOCHEMISTRY/SOLID WASTE SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
Bomb Calorimeter (Parr)	3584
Pensky-Martens Flash Point Tester (2)	1738/1425
Seta Flash Point Tester, #01SF	1660
CU Model 5000 Centrifuge	23472227
Burrell Wrist Action Shaker, #75	NA
Eberbach Platform Shaker	NA
Hazardous Waste Filtration Apparatus (2)	NA
pH Meter, Orion 407A	24218
Mettler H33 Analytical Balance	612924
Mettler PE3600 Balance	94817

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
METALS SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
Atomic Absorption Spectrophotometer, Perkin Elmer 5000	117880
Atomic Absorption Spectrophotometer, Perkin Elmer 2380	123505
EDL Power Supply	60005
EDL Power Supply	123032
Graphite Furnace Control, Perkin Elmer 5000	3042
Burner Control Box, Perkin Elmer 5000 (not in use)	87396
Furnace Analysis Autosampler, Model AS-40 and 1499	5107/2041/1499
Flame Analysis Autosampler, Model AS-50 (not in use)	37946
Atomic Vapor Accessory with Cell Kit, 440	1604
Atomic Vapor Accessory with Cell Kit, 440	1430
Water Bath, Fisher Scientific	L45633
Perkin Elmer PR310 Printer	021874
Furnace Power Supply HGA-600	4502
Perkin Elmer 7700 Professional Computer Color Monitor Keyboard	879519
5100 Atomic Absorption Spectrophotometer	130831
AS 60/70 Autosampler	6668
Dual EDL Power Supply	127749
Zeeman 5100 Furnace	6162
Inductively Coupled Argon Plasma Spectrometer, Jarrell-Ash, ICAP-9000	34483
Spectrometer Plasma Unit, Jarrell-Ash	10582
Autosampler, Jarrell-Ash	NA
Computer, Apple IIe, Model A2M2010 with Printer	742747
Disc, Drive 1	2098946
Disc, Drive 2	2150026
Peristaltic Pump (Rainin)	NA
Thermolyne Hot Plate, Model 2200	23712601

TABLE 12
MAKES AND MODELS OF LABORATORY EQUIPMENT
TOC/TOX SECTION
AMPHENOL CORPORATION
(Continued)

INSTRUMENT DESCRIPTION AND MODEL NUMBER	SERIAL NO.
TOC Analyzer (OIC Model 524, Sealing Unit)	0450-5-0563
TOC Analyzer (OIC Model 700)	5235-4-16
TOC Universal Sampler (OIC Model 68)	131442
Epson MX-80 Terminal Printer	8541-00
TOC Analyzer (OIC Model 700)	282-6-200
TOC Universal Sampler, ISCO	143340
OKIDATA Microline 192 Printer	412A0014745
Organic Halogen Analyzer, MCI Mitsubishi TOX 10C	43C00435018597
Microcoulometer TX 10D	43D00524018600
Combustion Unit TX 10R	43R00524018598
Flow Controller TX 10F	43F00524018599
Organic Halogen Analyzer, MCI Mitsubishi TOX 10C	43C2010518608
Microcoulometer TX 10D	43D20115018611
Combustion Unit TX 10R	43R20115018610
Flow Controller TX 10F	43F20105018609
2 Cole Palmer 10-Channel Master Flex Pump Drive	7568-00018605

TABLE

PARAMETERS DETECTED [illegible]MPLING EVENT

AMPHENOL CORPORATION

FRANKLIN, INDIANA

ANALYTICAL SUITE	SAMPLING EVENTS - DETECTED COMPOUNDS - CONCENTRATION RANGES			
	MAY 1988 (GROUND WATER)	NOVEMBER 1986 (GROUND WATER)	AUGUST 1986 (GROUND WATER)	MAY 1986 (GROUND WATER)
VOLATILE ORGANIC COMPOUNDS (PPB)	PRIORITY POLLUTANT LIST: 1,1-DICHLOROETHANE 251 1,1-DICHLOROETHENE 83 TETRACHLOROETHENE 3768 - 11281 1,1,1-TRICHLOROETHANE 37 - 15634 TRICHLOROETHENE 3781 - 7369	PRIORITY POLLUTANT LIST: BENZENE 1 1,1-DICHLOROETHANE 1.1 - 34 1,2-DICHLOROETHANE 6.2 1,1-DICHLOROETHYLENE 1.1 - 280 TETRACHLOROETHYLENE 16 - 26000 TRANS-1,2-DICHLOROETHYLENE 1 - 51 1,1,1-TRICHLOROETHANE 39 - 24000 TRICHLOROETHYLENE 55 - 9200 NON-PRIORITY POLLUTANTS: ACETONE 12 - 170	PRIORITY POLLUTANT LIST: BENZENE 1 - 2 1,1-DICHLOROETHANE 7.5 - 310 1,2-DICHLOROETHANE 24 1,1-DICHLOROETHYLENE 4.1 - 3000 METHYLENE CHLORIDE 61 TETRACHLOROETHYLENE 24 - 18000 TRANS-1,2-DICHLOROETHYLENE 5.6 - 8.9 1,1,1-TRICHLOROETHANE 30 - 9600 TRICHLOROETHYLENE 6.6 - 9700	PRIORITY POLLUTANT LIST: 1,1-DICHLOROETHANE 1 - 280 1,2-DICHLOROETHANE 3.6 - 1400 1,1-DICHLOROETHYLENE 1 - 120 TETRACHLOROETHYLENE 7.5 - 34000 1,1,1-TRICHLOROETHANE 5.2 - 25000 TRICHLOROETHYLENE 4 - 8000
SEMIVOLATILE COMPOUNDS (PPB)	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED
PESTICIDE/PCB COMPOUNDS (PPB)	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED
METALS (PPM)	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED
OTHER INORGANICS (PPM OR SPECIFIED)	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED	NOT ANALYZED

TABL[illegible]
PARAMETERS DETECTED [illegible] SAMPLING EVENT
AMPHENOL CORPORATION
FRANKLIN, INDIANA

ANALYTICAL SUITE	SAMPLING EVENTS - DETECTED COMPOUNDS - CONCENTRATION RANGES FEBRUARY 1986 (GROUND WATER)	FEBRUARY 1985 (GROUND, SURFACE & STORM SEWER WATER)	FEBRUARY 1984 (GROUND WATER)	FEBRUARY 1985 (SOIL BORINGS)
VOLATILE ORGANIC COMPOUNDS (PPB)	PRIORITY POLLUTANT LIST: CHLOROFORM 2.9 - 3.2 DICHLOROBROMOMETHANE 1.4 1,1-DICHLOROETHANE 1.3 - 360 1,2-DICHLOROETHANE 3.1 - 1600 1,1-DICHLOROETHYLENE 1.5 - 180 METHYLENE CHLORIDE 54 TETRACHLOROETHYLENE 1.2 - 17000 TRANS-1,2-DICHLOROETHYLENE 1 - 5.9 1,1,1-TRICHLOROETHANE 31 - 19000 TRICHLOROETHYLENE 40 - 14000 NON-PRIORITY POLLUTANTS: 2-BUTANONE 13 CARBON DISULFIDE 1.4 STYRENE 2.3	PRIORITY POLLUTANT LIST: BENZENE 1.2 - 8.7 CHLOROETHANE 2.0 - 2.2 1,1-DICHLOROETHANE 1.1 - 430 1,2-DICHLOROETHANE 1.6 1,1-DICHLOROETHYLENE 1.1 - 64 ETHYLBENZENE 1.9 - 28 METHYLENE CHLORIDE 1.2 - 5.8 1,1,2,2-TETRACHLOROETHANE 2.1 - 3.8 TETRACHLOROETHYLENE 1.1 - 9400 TOLUENE 1.2 - 63 TRANS-1,2-DICHLOROETHYLENE 2.3 1,1,1-TRICHLOROETHANE 1.1 - 13000 1,1,2-TRICHLOROETHANE 1.1 - 2000 TRICHLOROETHYLENE 2.0 - 19000 TRICHLOROFLUOROMETHANE 2.4 VINYL CHLORIDE 330 NON-PRIORITY POLLUTANTS: ACETONE 15 - 39 2-BUTANONE 10 - 40 CARBON DISULFIDE 2.0 - 37 4-METHYL-2-PENTANONE 14 STYRENE 1.0 - 5.4 TOTAL XYLENES 2.2 - 120	PRIORITY POLLUTANT LIST: CHLOROFORM 1.7 1,1-DICHLOROETHANE 7.8 - 42 CHLOROBENZENE 4.3 ETHYLBENZENE 5.8 - 12.2 TOLUENE 3.4 - 27 CARBON TETRACHLORIDE 45 TRANS-1,2-DICHLOROETHYLENE 1.0 - 1.4 TRICHLOROETHYLENE 160 - 16600 TETRACHLOROETHYLENE 611 - 3200 1,1,1-TRICHLOROETHANE 85 - 3700	PRIORITY POLLUTANT LIST: BENZENE 12 - 25 CHLOROFORM 15 - 290 1,1,2,2-TETRACHLOROETHANE 11 TETRACHLOROETHYLENE 27 - 460 1,1,1-TRICHLOROETHANE 21 - 220 TRICHLOROETHYLENE 41 - 1000 NON-PRIORITY POLLUTANTS: ACETONE 830
SEMIVOLATILE COMPOUNDS (PPB)	NOT ANALYZED	NOT ANALYZED	PRIORITY POLLUTANT LIST: NO DETECTS	NOT ANALYZED
PESTICIDE/PCB COMPOUNDS (PPB)	NOT ANALYZED	NOT ANALYZED	PRIORITY POLLUTANT LIST: NO DETECTS	NOT ANALYZED
METALS (PPM)	NOT ANALYZED	PRIORITY POLLUTANT METALS/INORGANICS: (EXCLUDING ANTIMONY AND THALLIUM) ARSENIC 0.002 - 0.038 CADMIUM 0.014 CHROMIUM 0.001 - 0.43 COPPER 0.02 - 1.1 CYANIDE 0.39 - 3.8 LEAD 0.01 - 0.73 MERCURY 0.0002 - 0.0015 NICKEL 0.01 - 0.19 SELENIUM 0.002 - 0.006 SILVER 0.001 ZINC 0.01 - 2.1 OTHER: BARIUM 0.02 - 0.54	PRIORITY POLLUTANT METALS/INORGANICS: ANTIMONY 0.01 - 0.1 CHROMIUM 0.01 - 0.02 COPPER 0.04 - 0.07 NICKEL 0.05 - 0.15 THALLIUM 0.1 ZINC 0.072 - 0.089 OTHER: BERYLLIUM 0.01 CALCIUM 88 - 145 IRON 1.1 - 8.9 MAGNESIUM 21.9 - 37.2 TIN 1	NOT ANALYZED
OTHER INORGANICS (PPM OR SPECIFIED)	NOT ANALYZED	NOT ANALYZED	CONVENTIONAL PARAMETERS: NITRATE 1.9 - 7.8 CHLORIDE 20 - 32 SULFATE 23 - 65 HARDNESS 310 - 515 pH (S.U.) 7.4 - 7.6 SPEC. COND. (uMHOS/CM) 600 - 800	NOT ANALYZED

TABLE 13
PARAMETERS DETECTED BY SAMPLING EVENT
AMPHENOL CORPORATION
FRANKLIN, INDIANA

ANALYTICAL SUITE	SAMPLING EVENTS - DETECTED COMPOUNDS - CONCENTRATION RANGES		
	SEPTEMBER 1984 (HAND AUGER SOILS)	AUGUST 1984 (HAND AUGER SOILS)	FEBRUARY 1984 (SOIL BORINGS & HAND AUGER SOILS)
VOLATILE ORGANIC COMPOUNDS (PPB)	PRIORITY POLLUTANT LIST: CHLOROBENZENE 3 CHLOROFORM 6 - 57000 1,1-DICHLOROETHENE 2 - 970 1,2-DICHLOROPROPANE 2 FLUOROTRICHLOROMETHANE 19 - 68 METHYLENE CHLORIDE 12 - 188 TETRACHLOROETHENE 170 - 275000 1,1,1-TRICHLOROETHANE 3 - 89000 TRICHLOROETHENE 6 - 63000	PRIORITY POLLUTANT LIST: TETRACHLOROETHENE 160 - 2100 1,1,1-TRICHLOROETHANE 150 TRICHLOROETHENE 80 - 2100	PRIORITY POLLUTANT LIST: BENZENE 29 - 76 CHLOROBENZENE 19 - 52 1,1,1-TRICHLOROETHANE 44 - 140 ETHYLBENZENE 24 - 85 METHYLENE CHLORIDE 63 - 640 TETRACHLOROETHYLENE 400 - 36300 TOLUENE 22 - 63 TRICHLOROETHYLENE 88 - 19600
ABNs? SEMIVOLATILE COMPOUNDS (PPB)	NOT ANALYZED	NOT ANALYZED	PRIORITY POLLUTANT LIST: NO DETECTS
PESTICIDE/PCB COMPOUNDS (PPB)	NOT ANALYZED	NOT ANALYZED	PRIORITY POLLUTANT LIST: NO DETECTS
METALS (PPM)	NOT ANALYZED	NOT ANALYZED	EP TOXICITY METALS: BARIUM 0.1 0.5 CADMIUM 0.02 - 0.11 CHROMIUM 0.01 - 0.04 LEAD 0.1 - 0.4 SILVER 0.01 - 0.03
OTHER INORGANICS (PPM OR SPECIFIED)	OTHER: TOTAL CYANIDE 0.11 - 610 CYANIDE REACTIVE 1.0 - 5.5 pH (S.U.) 5.5 - 10.0	OTHER: TOTAL CYANIDE 0.4 - 21 pH (S.U.) 5.0 - 9.0	OTHER: TOTAL CYANIDE 0.8 - 266 pH (S.U.) 6.5 - 9.8

TABLE 14
NUMBER OF QA SAMPLES TO BE COLLECTED
FOR SOIL AND SEDIMENT SAMPLING
AMPHENOL CORPORATION

SOIL BORING SAMPLES

ANALYTICAL PARAMETER	NUMBER OF SAMPLES TO BE COLLECTED	QA SAMPLES			TOTAL
		BLANKS[a]	DUP./SPLITS[a][b]	TRIP BLANKS[c]	
Volatiles (VOCs)	33	3	3	3	42
Metals (excl. Hg)	27	2	2	--	31
Mercury	27	2	2	--	31
Total and Amenable Cyanide	33	3	3	--	39
SEDIMENT SAMPLES					
Volatiles (VOCs)	5	1	1	1	8
Metals (exc. Hg)	5	1	1	--	7
Mercury	5	1	1	--	7
Total and Amenable Cyanide	5	1	1	--	7

[a] Based on U.S. EPA CLP procedures - 1 blank and 1 dup./split will be collected per every 15 samples collected.

[b] Soil/sediment VOC samples should be duplicates; soil non-VOC samples should be split samples.

[c] Is an estimate; the number of trip blanks which will be submitted depends on the judgment of the Field Team Leader, and the number of sample shipments to the laboratory.

TABLE 15
NUMBER OF QA SAMPLES TO BE COLLECTED
FOR GROUND WATER AND SURFACE WATER SAMPLING
AMPHENOL CORPORATION

GROUND WATER SAMPLES

ANALYTICAL PARAMETER	NUMBER OF SAMPLES TO BE COLLECTED	QA SAMPLES			TOTAL
		BLANKS[a]	DUP./SPLITS[a]	TRIP BLANKS[b]	
Volatiles (VOCs)	12	1	1	1	15
Metals (excl. Hg)	12	1	1	--	14
Mercury	12	1	1	--	14
Total and Amenable Cyanide	12	1	1	--	14

SURFACE WATER SAMPLES

ANALYTICAL PARAMETER	NUMBER OF SAMPLES TO BE COLLECTED	BLANKS[a]	DUP./SPLITS[a]	TRIP BLANKS[b]	TOTAL
Volatiles (VOCs)	5	1	1	1	8
Metals (exc. Hg)	5	1	1	--	7
Mercury	5	1	1	--	7

[a] Based on U.S. EPA CLP procedures - 1 blank and 1 dup./split will be collected per every 15 samples collected.
[b] Is an estimate; the number of trip blanks which will be submitted depends on the judgment of the Field Team Leader, and the number of sample shipments to the laboratory.

TABLE 16
RELATIVE PERCENT DIFFERENCE (RPD) LIMITS
FOR ANALYTICAL PARAMETERS[(1)]
AMPHENOL CORPORATION

	RPD LIMIT(±)	
VOLATILES (VOCs)	WATER (%)	SOIL/SEDIMENT (%)
1,1-Dichloroethene	14	22
Trichloroethene	14	24
Benzene	11	21
Toluene	13	21
Chlorobenzene	13	21
METALS		
Metals (exc. Hg)	20	20
Mercury	20	20
CYANIDE		
Total Cyanide	20	20
Amenable Cyanide	20	20

(1) The QA objectives prescribed here may be attainable only for samples that are homogeneous and "well behaved."

TABLE 17
PERCENT RECOVERY LIMITS (%R) FOR ANALYTICAL PARAMETERS
AMPHENOL CORPORATION

VOLATILES (VOCs)	WATER (%)	SOIL/SEDIMENT (%)
1,1-Dichloroethene	61-145	59-172
Trichloroethene	71-120	62-137
Chlorobenzene	75-130	60-133
Toluene	76-125	59-139
Benzene	76-127	66-142
METALS		
Metals (exc. Hg)	75-125	75-125
Mercury	75-125	75-125
CYANIDE		
Total Cyanide	75-125	75-125
Amenable Cyanide	75-125	75-125

TABLE 18

EMERGENCY RESPONSE AGENCIES

Hospital:	736-3300
Ambulance Service:	736-6501
Fire Department:	736-5111
Police Department:	736-5111

TABLE 19

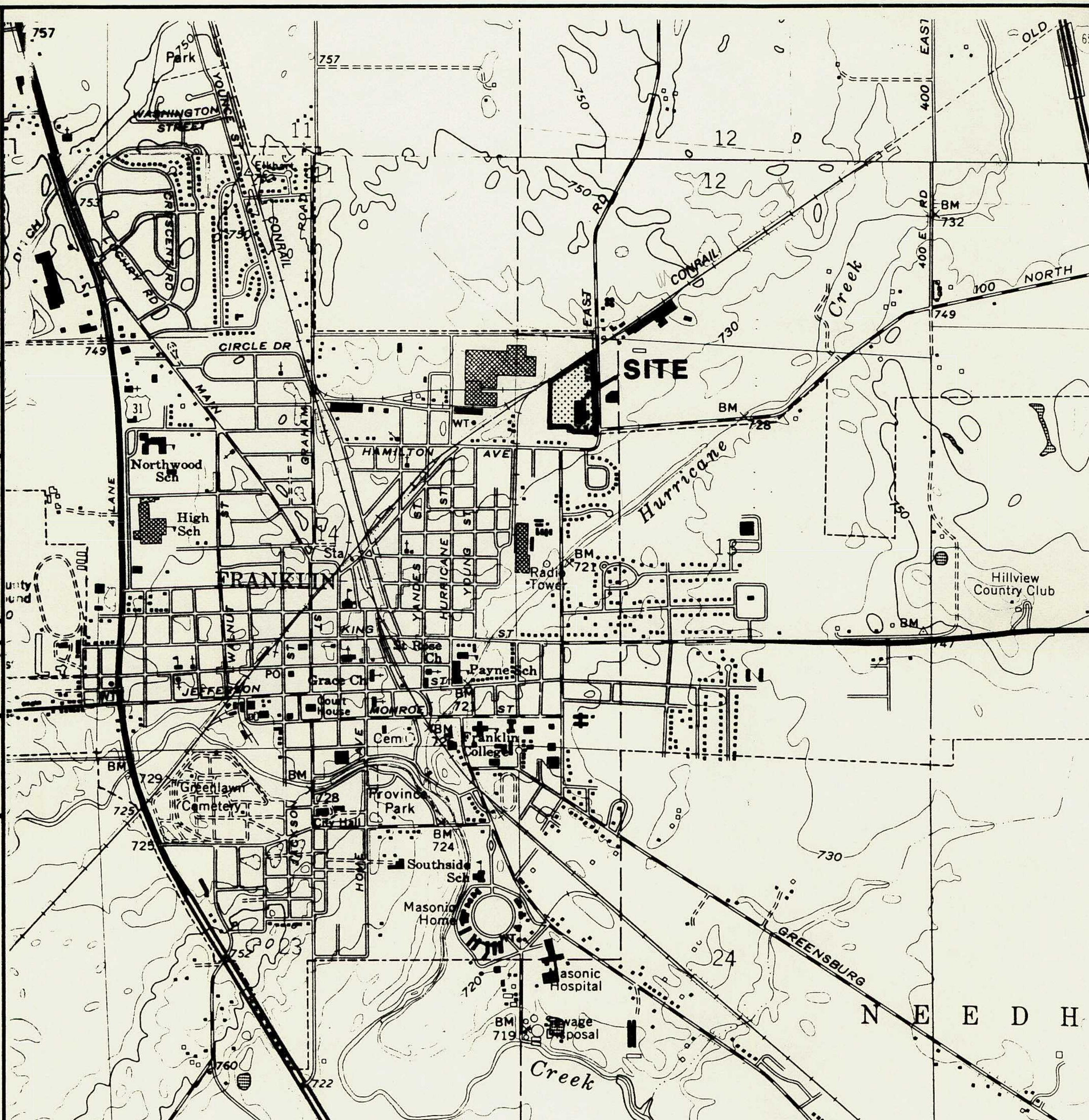
PROJECT SCHEDULE
AMPHENOL CORPORATION
FRANKLIN, INDIANA

DATE (week)[a]	ACTIVITY
March 25, 1988	Submittal of Draft RCRA Facility Investigation Work Plan and Quality Assurance Plan
April 11, 1988	Submit Draft RCRA Facility Investigation Work Plan and Quality Assurance Plan to U.S. EPA
July 7, 1988	Receive review comments from U.S. EPA
August 19, 1988	Submit Review Comments and Response document to U.S. EPA
August - Sept. 1988	Telephone conversations with U.S. EPA to revise RCRA Facility Investigation Work Plan and Quality Assurance Plan
October 21, 1988	Submit revised work plan to U.S. EPA for approval
November 18, 1988	Receive Approval to Proceed with RFI phase
(2)	Install monitoring wells and drill soil borings
(7)	Collect ground water, surface water, and sediment sample
(15)	Submittal of Draft Facility Investigation Report to U.S. EPA
(19)	Receipt of U.S. EPA comments
(22)	Submittal of Final Facility Investigation Report to Amphenol and U.S. EPA

[a]Numbers in parentheses denote weeks after receiving approval to proceed.

DRAWING NUMBER 302443-A1

DRAWN BY			CHECKED BY / APPROVED BY		
SLK	3-21-88		SLK / RRS	3-21-88 / 3-21-88	



0 2000 4000

SCALE IN FEET

N

SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP - FRANKIN

FIGURE 1

SITE LOCATION MAP

PREPARED FOR

AMPHENOL CORPORATION

FRANKLIN, INDIANA

IT ... Creating a Safer Tomorrow

"Do Not Scale This Drawing"

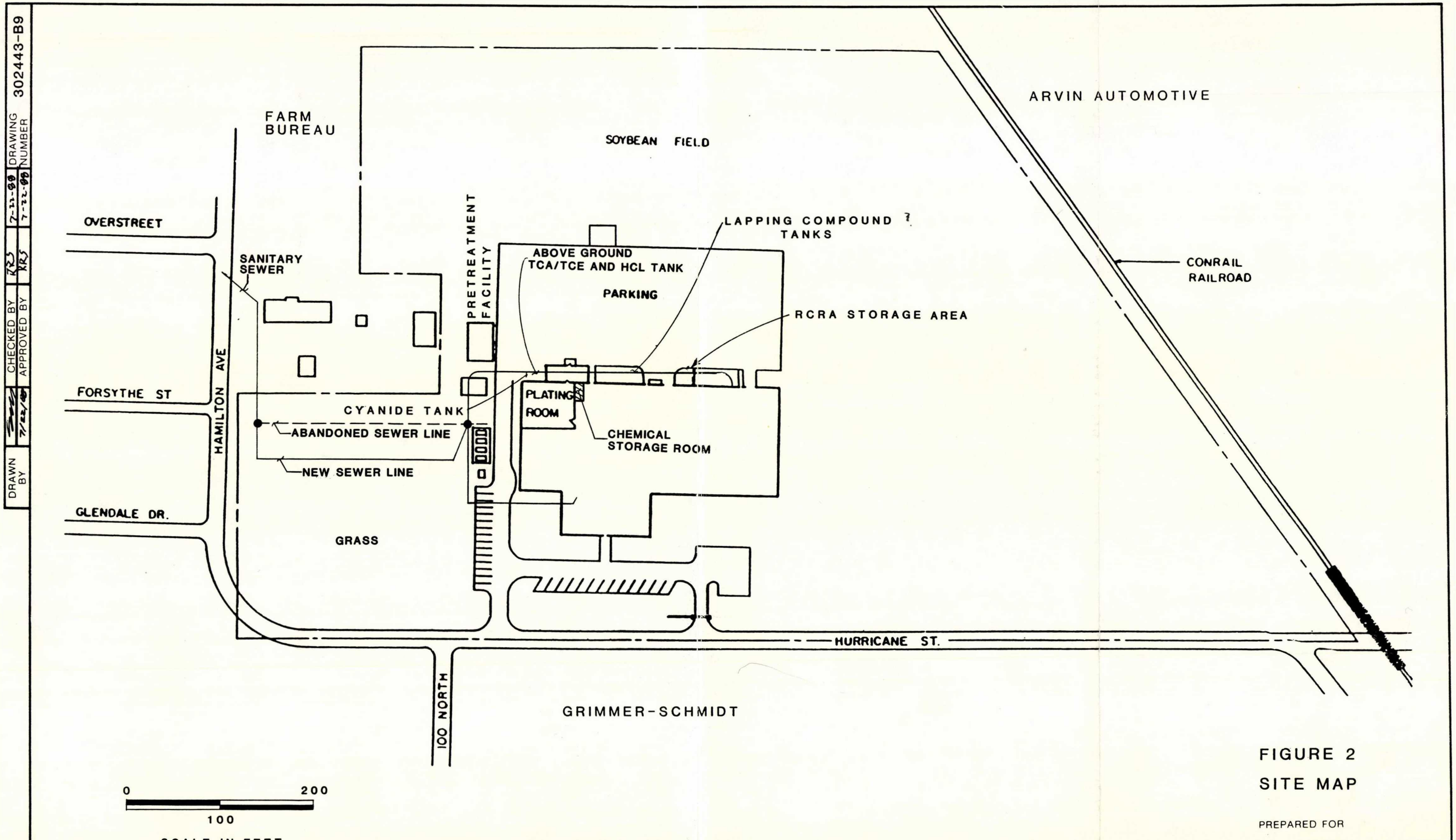


FIGURE 2

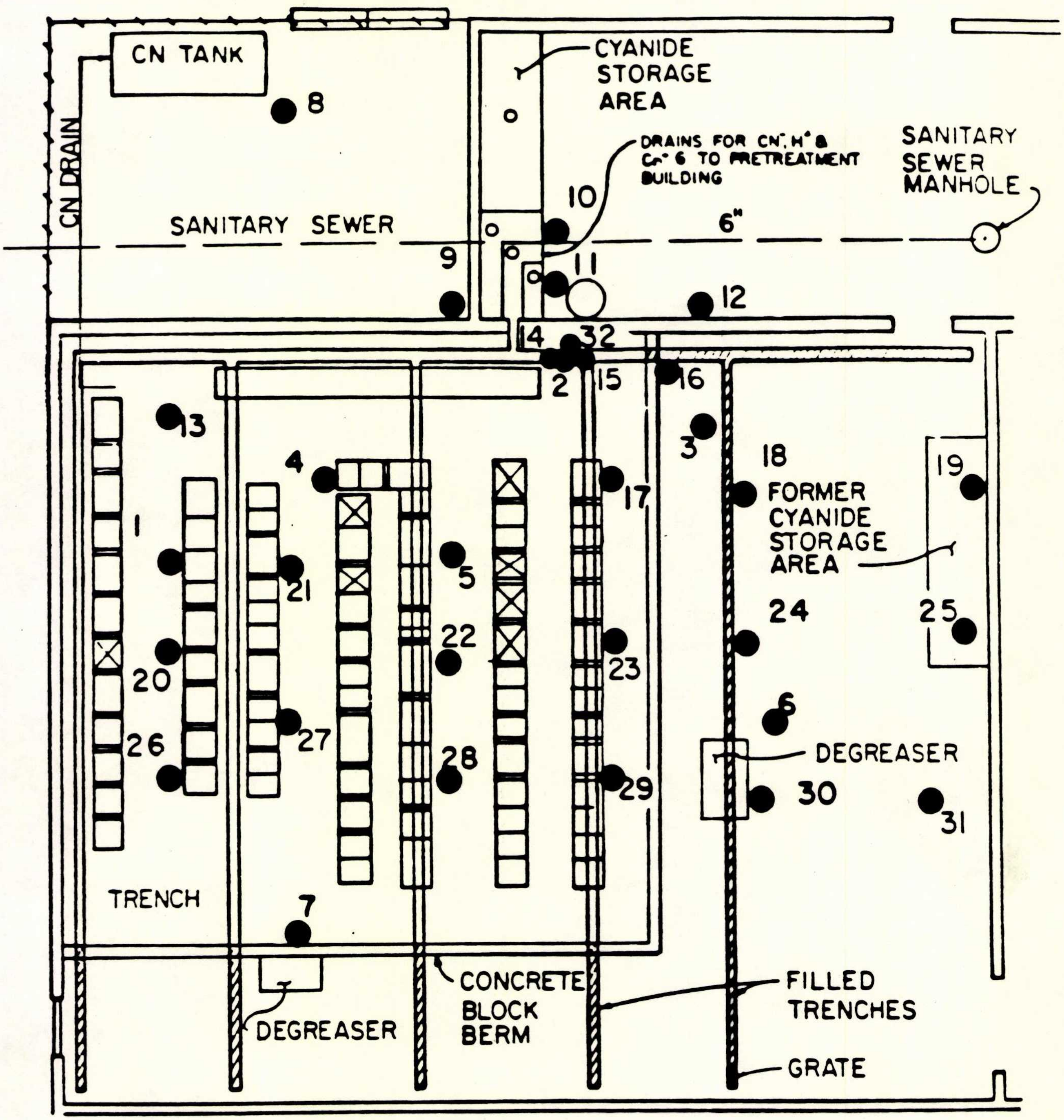
SITE MAP

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

NOTE:
HCL TANK HAS BEEN REMOVED FROM THE SITE
TCA TANK WAS USED FOR STORAGE
OF TCE FOLLOWING DISCONTINUATION OF USE OF TCA BY PLANT

IT ... Creating a Safer Tomorrow



DRAWING NUMBER 302443-A2

DRAWN BY | CHECKED BY | APPROVED BY

0 10 20

SCALE IN FEET

LEGEND

1 ● BORING LOCATION

FIGURE 3

PLATING ROOM INVESTIGATION

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

SOURCE: PLATING ROOM INVESTIGATION
ATEC ASSOCIATES, INC. 1984

IT . . . Creating a Safer Tomorrow

"Do Not Scale This Drawing"

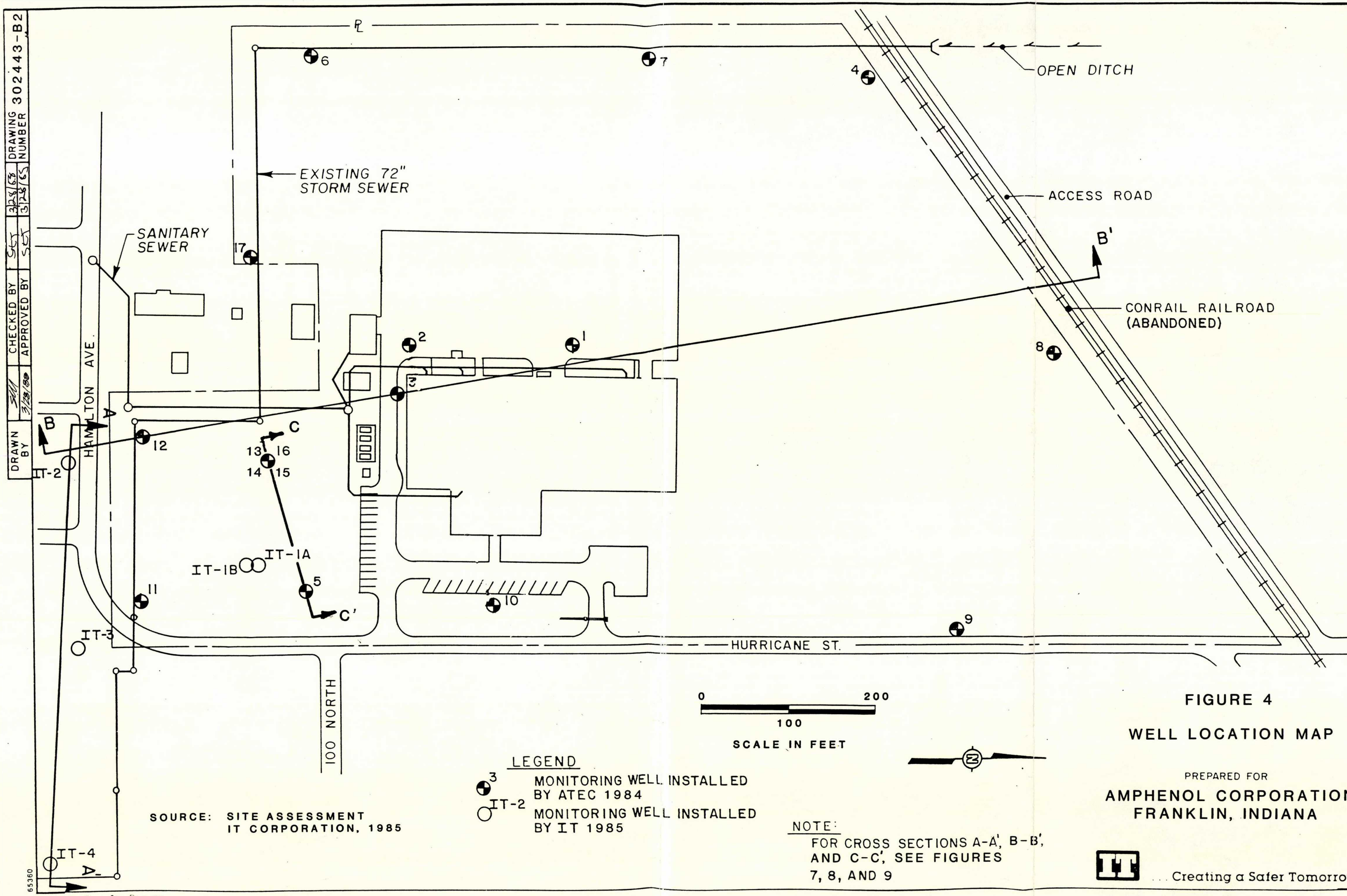


FIGURE 4

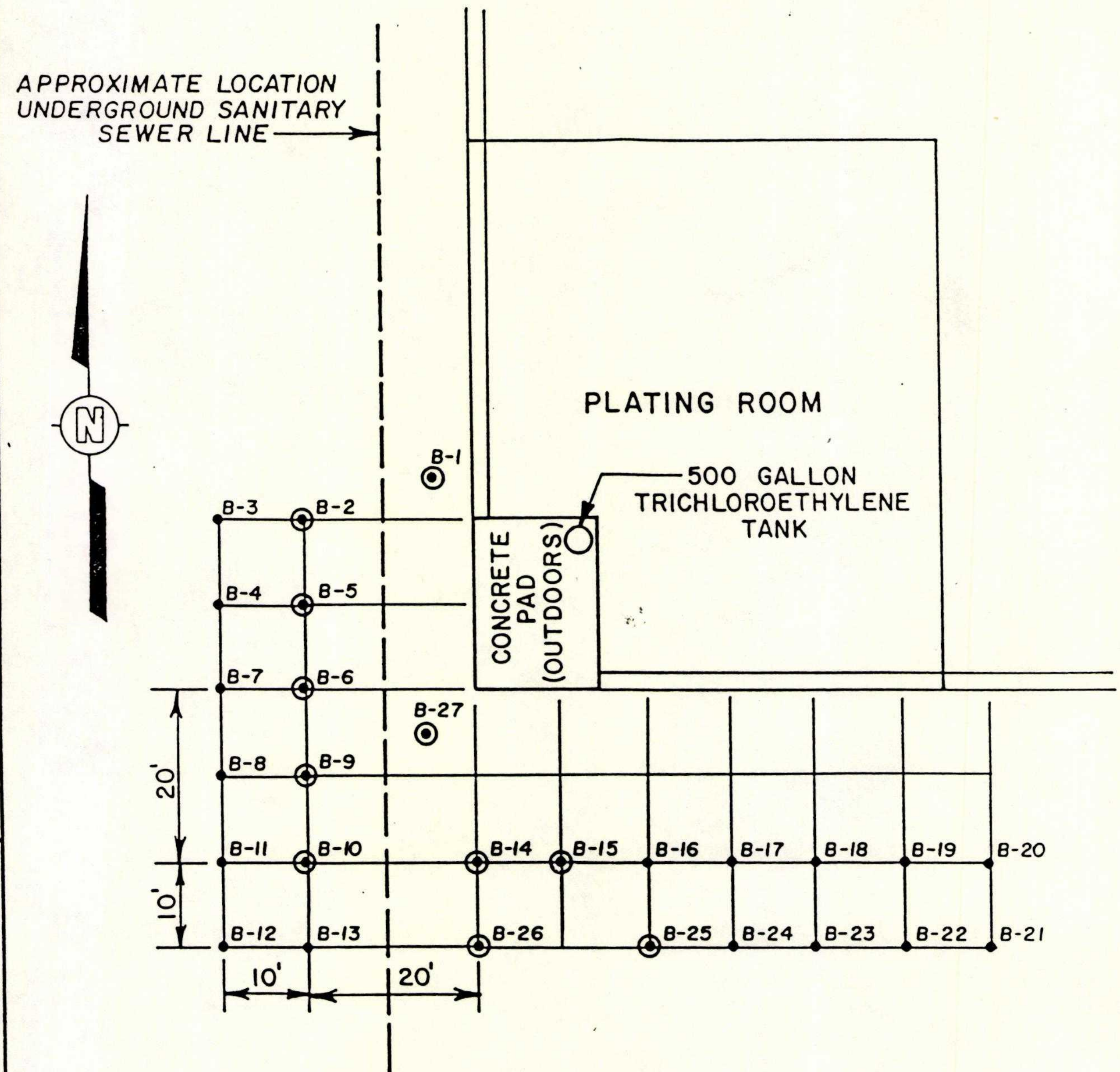
WELL LOCATION MAP

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

IT ... Creating a Safer Tomorrow

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
RW 4-2-85	LRS 7/11/85	TLH 7/11/85	30[illegible]443-A9



LEGEND

- • SOIL SAMPLING LOCATION
- ⊙ SOIL SAMPLES SUBMITTED FOR VOLATILE ORGANICS ANALYSES

SCALE

0 20 40 FEET

FIGURE 5

SHALLOW SOIL SAMPLING GRID

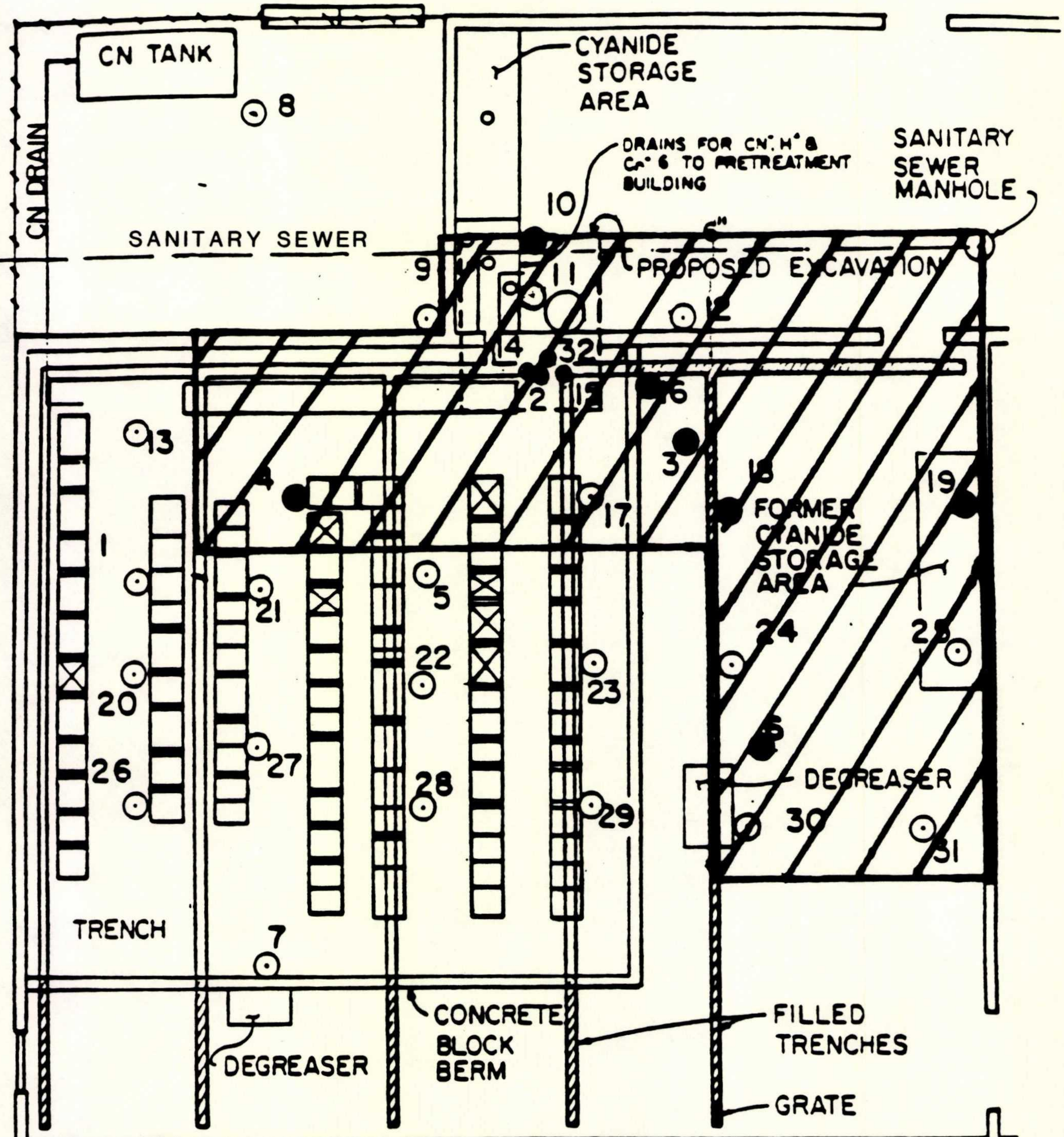
PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

IT ... Creating a Safer Tomorrow

DRAWING NUMBER 302443-A3

DRAWN BY | CHECKED BY | APPROVED BY



LEGEND

○ BORING LOCATION CYANIDE <10ppm

● BORING LOCATION CYANIDE >10ppm

EXCAVATION AREA

0 10 20

SCALE IN FEET

FIGURE 6

PLATING ROOM EXCAVATION AREA

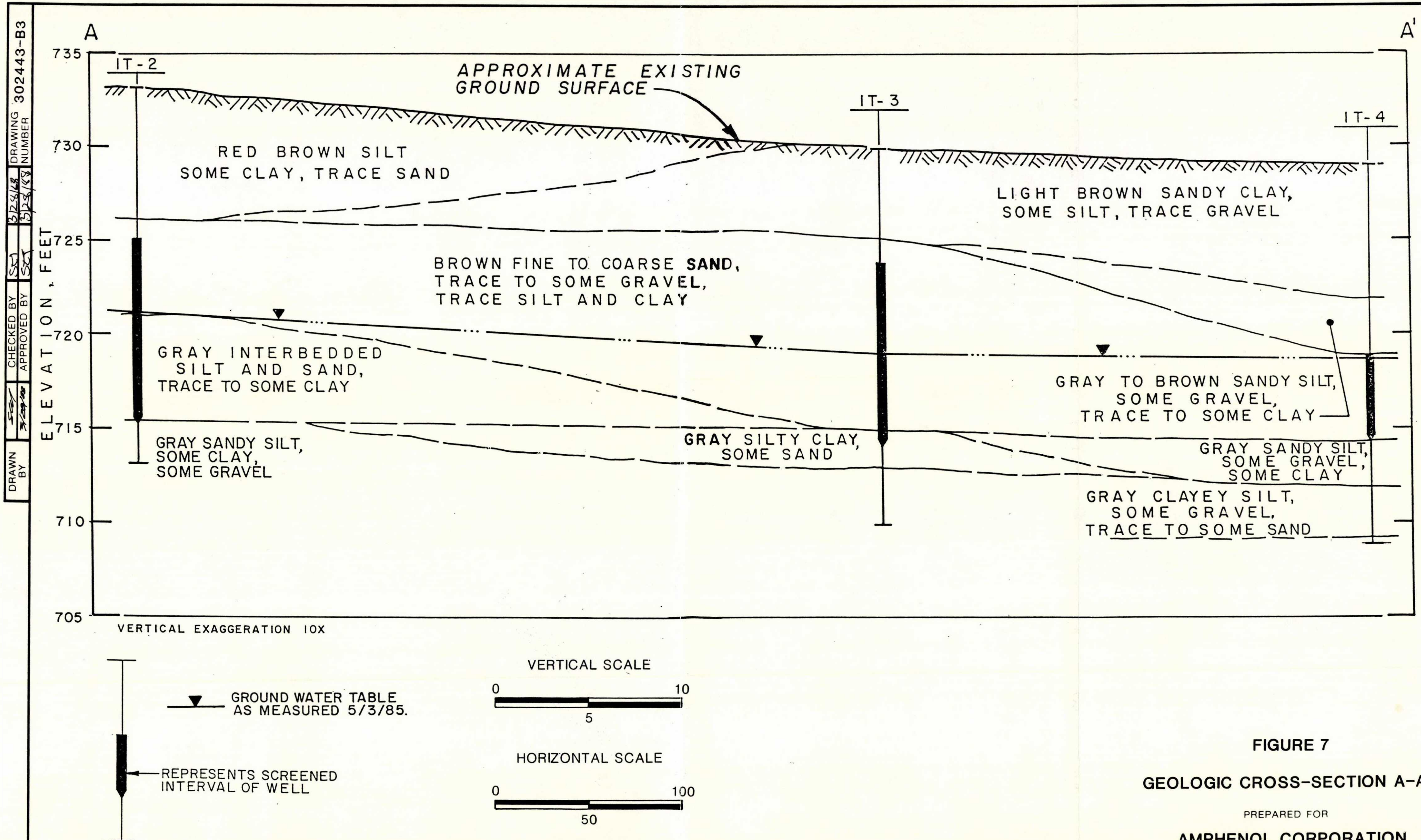
PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

SOURCE: ENVIRONMENTAL DISCLOSURE STATEMENT AMPHENOL CORPORATION

IT ... Creating a Safer Tomorrow

"Do Not Scale This Drawing"



SOURCE: SITE ASSESSMENT, IT CORPORATION 1985

NOTE: FOR CROSS-SECTION LOCATION, SEE FIGURE 4

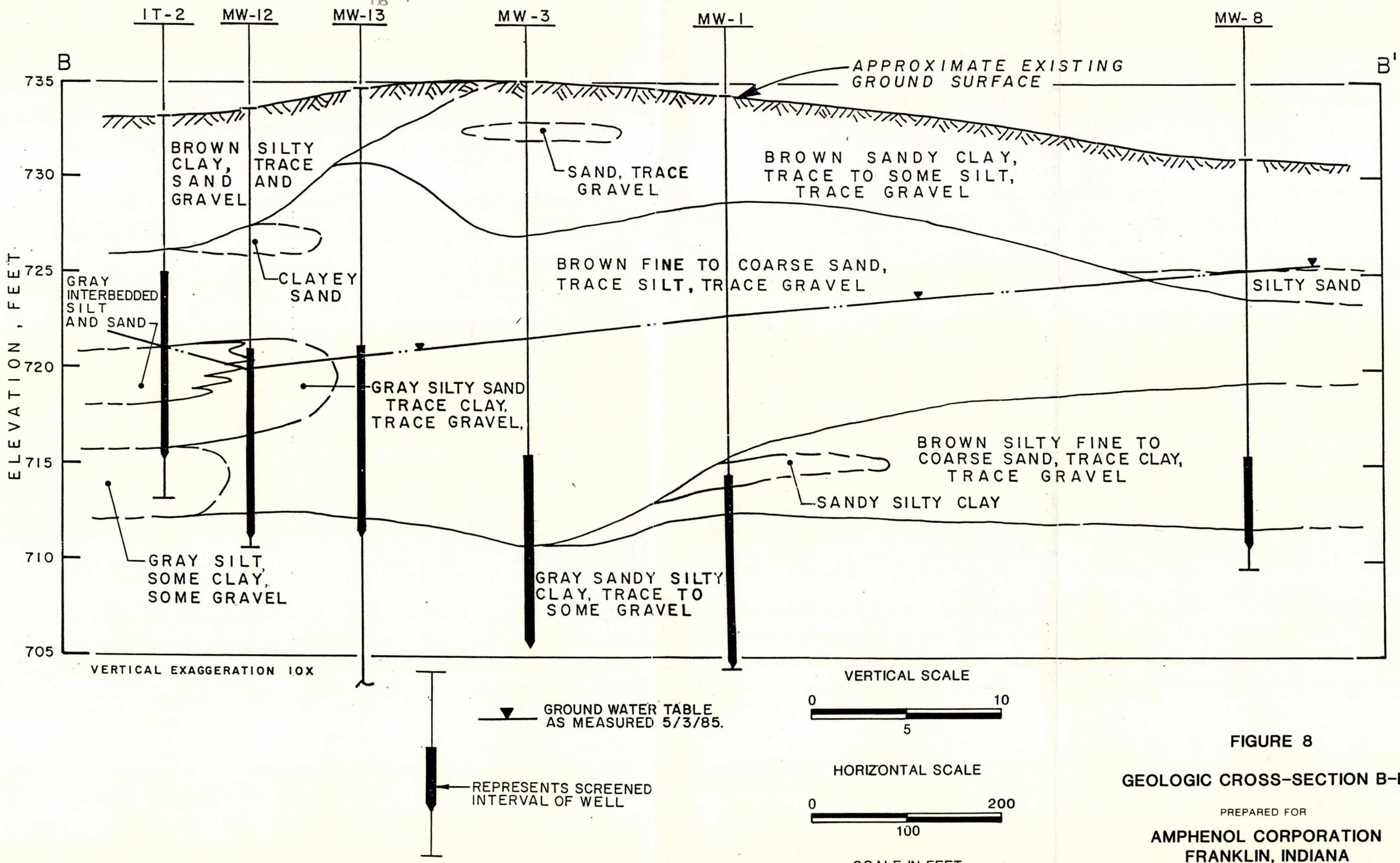
FIGURE 7

GEOLOGIC CROSS-SECTION A-A'

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

... Creating a Safer Tomorrow



DRAWN BY	CHECKED BY / APPROVED BY		DRAWING NUMBER
SWL 3/20/86	SLS / SWS	3/23/86 / 3/23/86	302443-B4

FIGURE 8

GEOLOGIC CROSS-SECTION B–B'

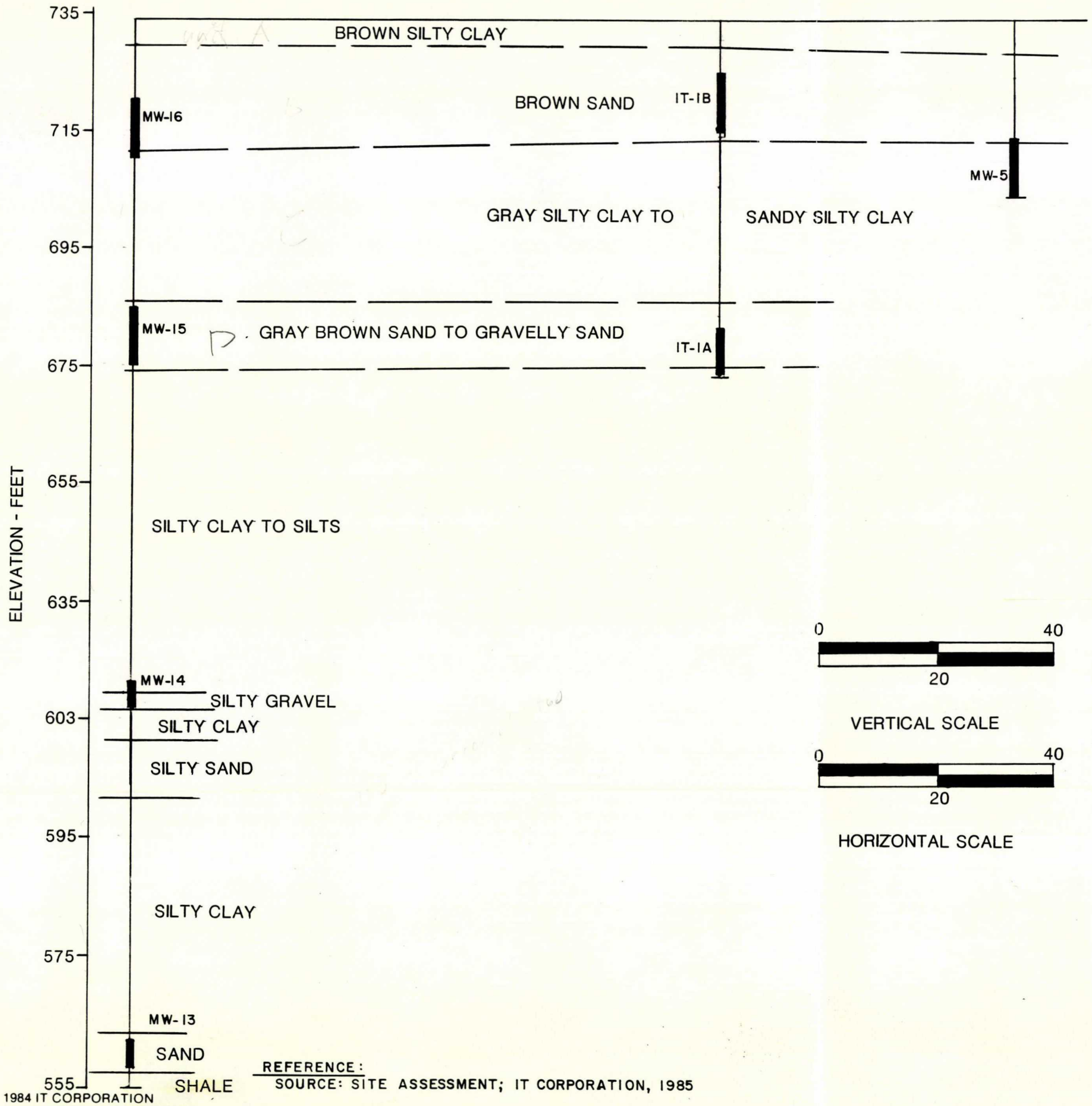
PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

SOURCE: SITE ASSESSMENT, IT CORPORATION 1985

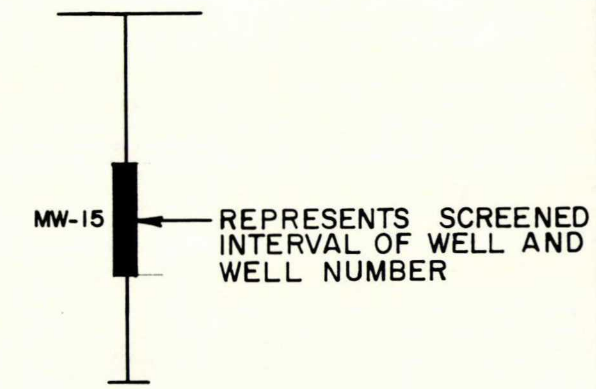
NOTE: FOR CROSS-SECTION LOCATION, SEE FIGURE 4

IT ... Creating a Safer Tomorrow



REFERENCE:
SOURCE: SITE ASSESSMENT; IT CORPORATION, 1985

LEGEND



NOTE:
FOR LOCATION OF CROSS-SECTION C-C' SEE FIGURE 4.

FIGURE 9

GEOLOGIC CROSS-SECTION C – C'

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

IT ... Creating a Safer Tomorrow

DRAWN BY	RBS 9-23-88	CHECKED BY	SGT 10/19/88	APPROVED BY	SET 10/19/88	DRAWING NUMBER	302443-A10

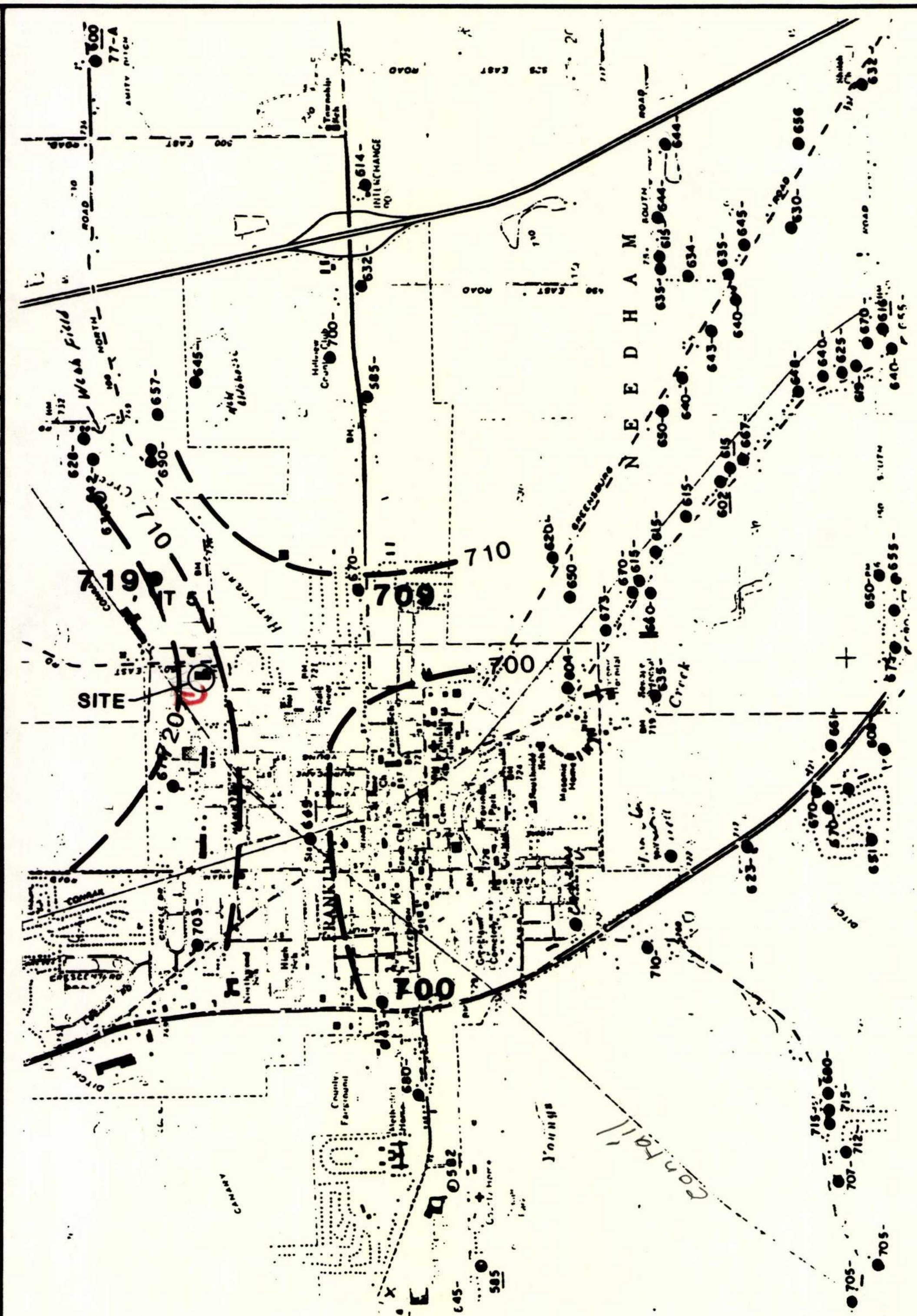
"Do Not Scale This Drawing"

DRAWING NUMBER 302443-A7

DRAWN BY 7/22/88

CHECKED BY RLS 7-22-88

APPROVED BY RLS 7-22-88



Approx. Scale 1 : 3,000 ok

LEGEND

700 WATER LEVEL AT INSTALLATION

628 ● WELL AND IDNR NUMBER

720— GROUND WATER CONTOUR

Source: Letter Report to Allied Chemical From Atec Assoc. June 1984 Base Map is Franklin Quadrangle USGS Topographic Map 7.5 Minute Series

"Do Not Scale This Drawing"

FIGURE 10

REGIONAL GROUND WATER CONTOURS

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

IT ... Creating a Safer Tomorrow

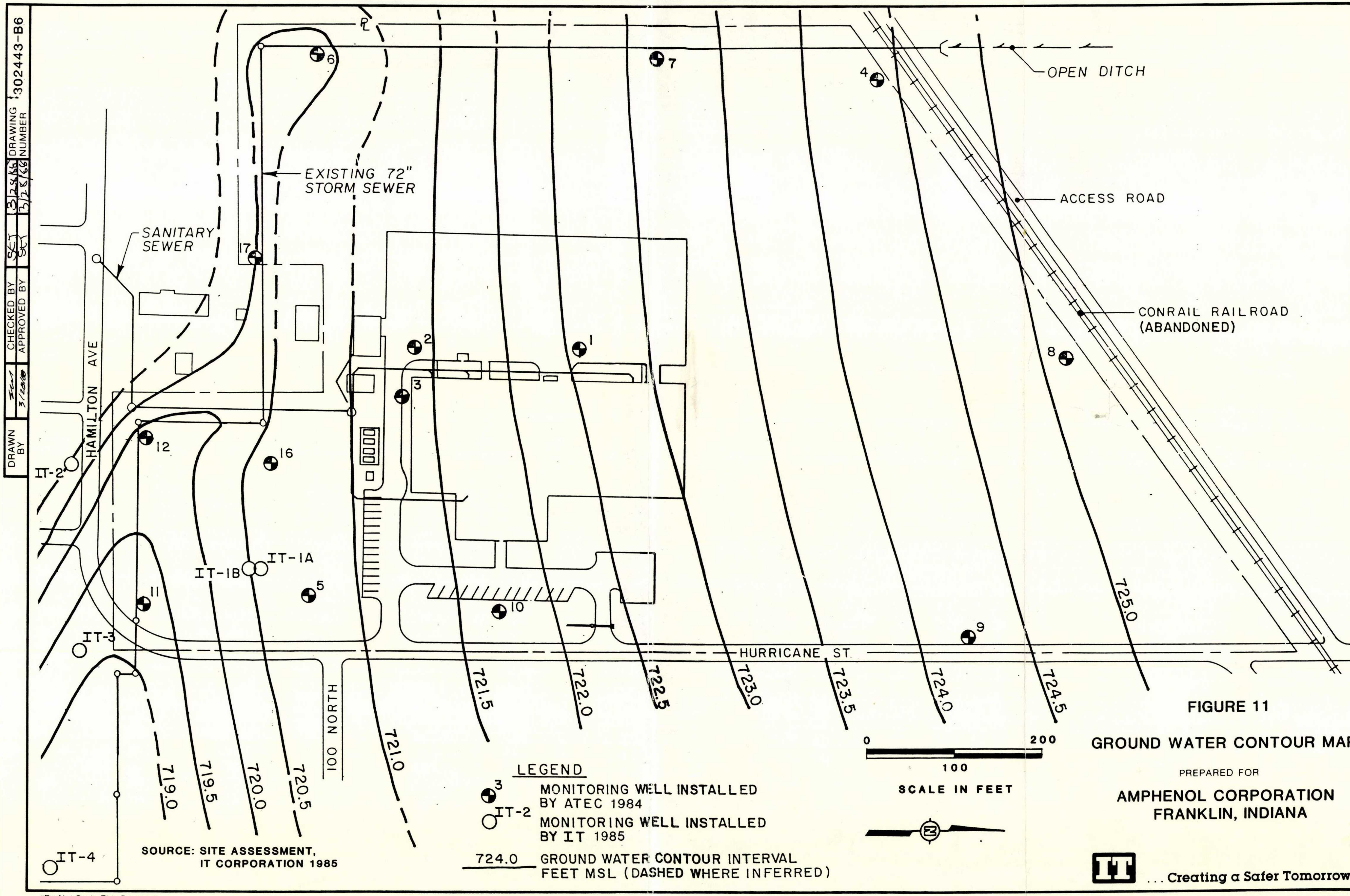


FIGURE 11

GROUND WATER CONTOUR MAP

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

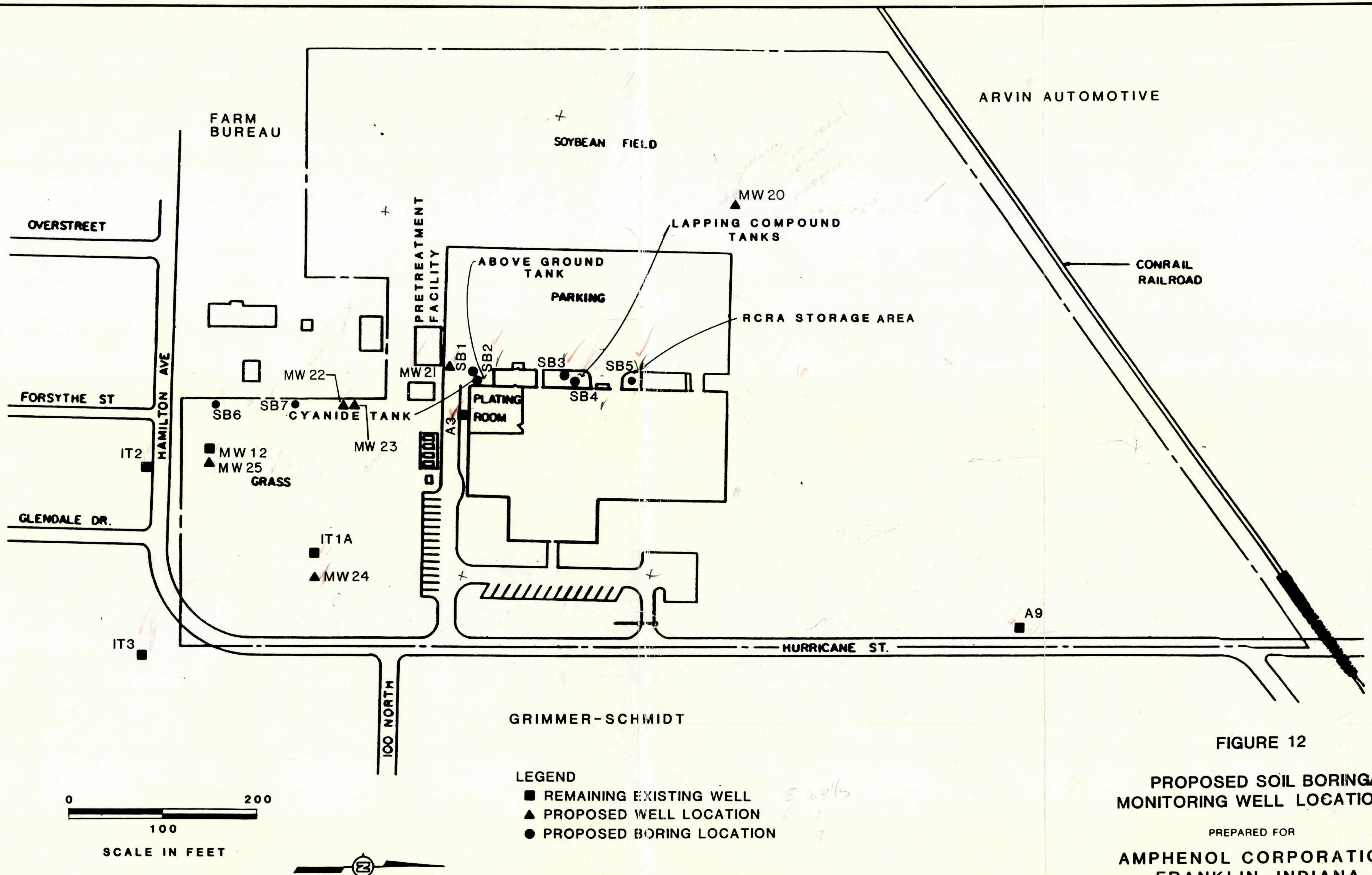


FIGURE 12

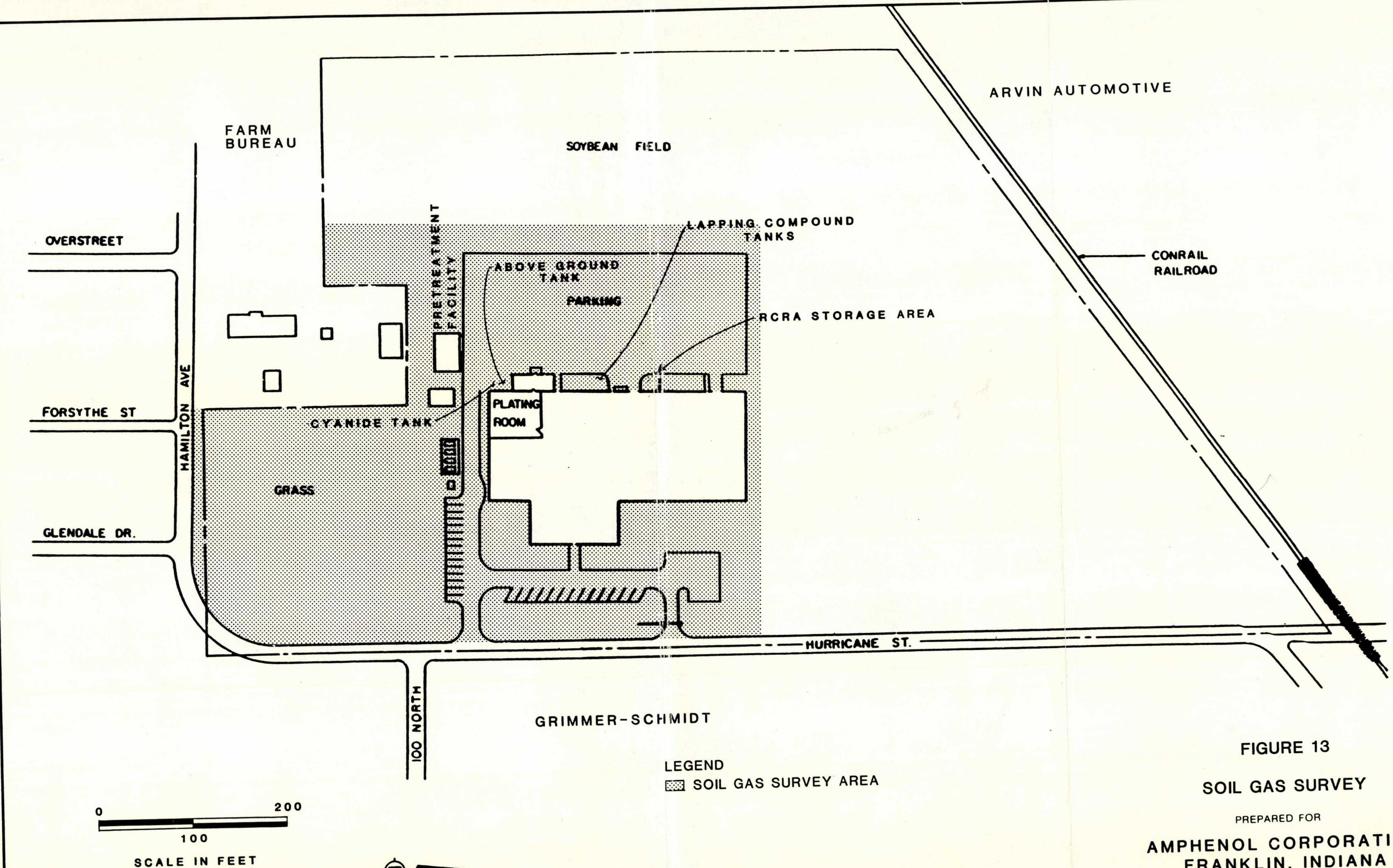
PROPOSED SOIL BORING/ MONITORING WELL LOCATIONS

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

IT ...Creating a Safer Tomorrow

DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER	302443-B7



DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
3/28/88	SCT 3/28/88	SCT 3/28/88	302443-B8

FIGURE 13

SOIL GAS SURVEY

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

IT ...Creating a Safer Tomorrow

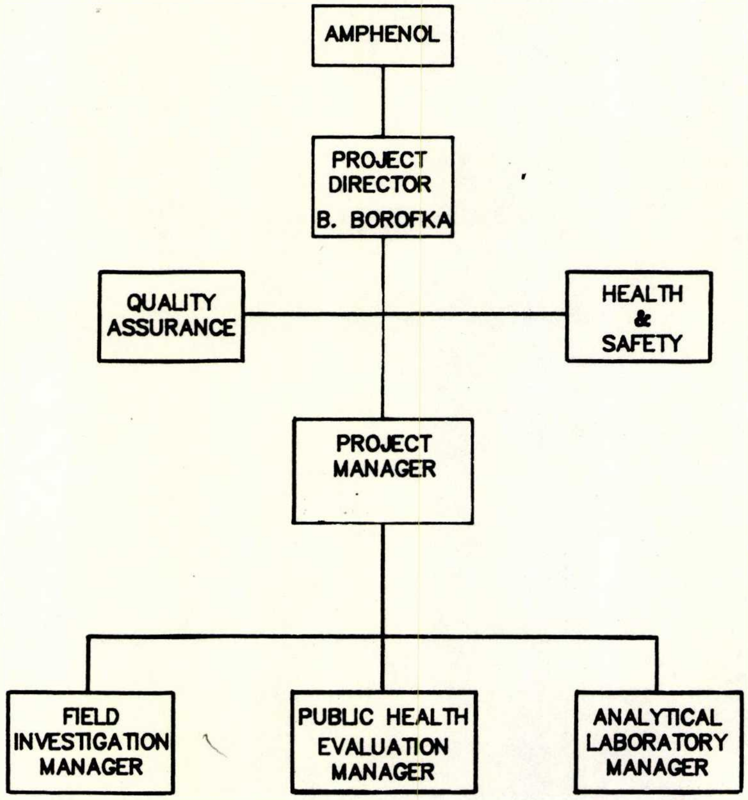


FIGURE 26

ORGANIZATIONAL CHART

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

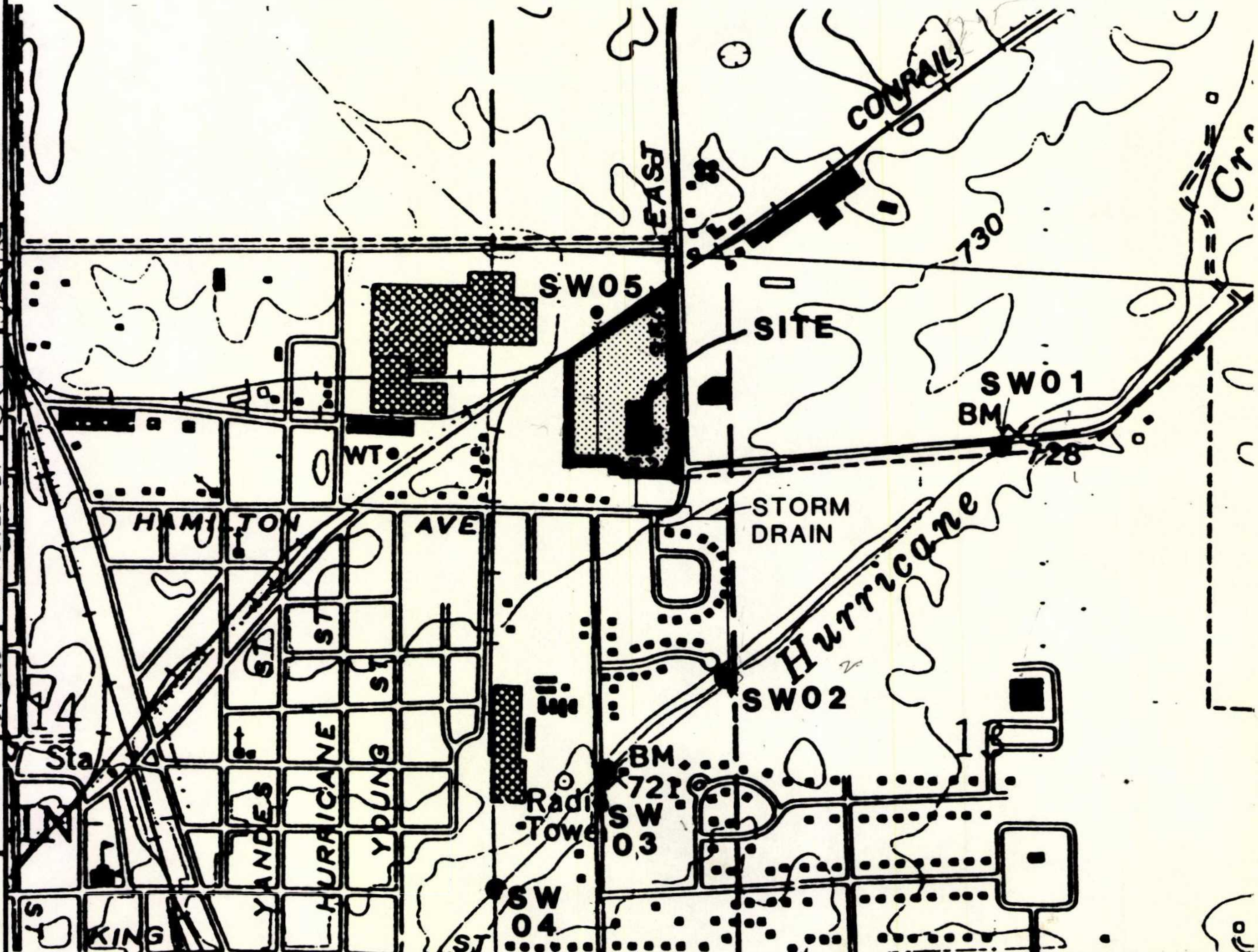
... Creating a Safer Tomorrow

DRAWING NUMBER 3024[illegible]-A5

CHECKED BY RRS 4/7/88
APPROVED BY RRS 4/7/88
DRAWN BY [illegible] 4/7/88

"DO NOT SCALE THIS DRAWING"

DRAWN BY | CHECKED BY | APPROVED BY | DRAWING NUMBER 302443-A4



LEGEND

● SAMPLING LOCATION

0 1000 2000

SCALE IN FEET

SOURCE - FIGURE 1

FIGURE 14

SURFACE WATER/ SEDIMENT SAMPLING LOCATIONS

PREPARED FOR

AMPHENOL CORPORATION
FRANKLIN, INDIANA

"Do Not Scale This Drawing"

IT ... Creating a Safer Tomorrow

INTERNATIONAL TECHNOLOGY CORPORATION

FIGURF

CHAIN-OF-CUSTODY RECORD

R/A Control No. ____________

C/C Control No.

PROJECT NAME/NUMBER ____________ LAB DESTINATION ____________

SAMPLE TEAM MEMBERS ____________ CARRIER/WAYBILL NO. ____________

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No

Special Instructions: ____________

Possible Sample Hazards: ____________

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: ____________

   Received By: ____________

2. Relinquished By: ____________

   Received By: ____________

3. Relinquished By: ____________

   Received by: ____________

4. Relinquished By: ____________

   Received By: ____________

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

FIGURE 1

REQUEST FOR ANALYSIS

R/A Control No.

C/C Control No. ______

PROJECT NAME ______

PROJECT NUMBER ______

PROJECT MANAGER ______

BILL TO ______

______

______

PURCHASE ORDER NO. ______

DATE SAMPLES SHIPPED ______

LAB DESTINATION ______

LABORATORY CONTACT ______

SEND LAB REPORT TO ______

______

______

DATE REPORT REQUIRED ______

PROJECT CONTACT ______

PROJECT CONTACT PHONE NO. ______

Sample No	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ______ Rush ______ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ______ Flammable ______ Skin Irritant ______ Highly Toxic ______ Other ______ (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ______ Disposal by Lab ______

FOR LAB USE ONLY

Received By ______ Date/Time ______

WHITE - Original, to accompany samples
YELLOW - Field copy

FIGURE 17

IT CORPORATION

DAILY LOG			
DATE			
NO.			
SHEET	OF		

FIELD ACTIVITY DAILY LOG

PROJECT NAME	PROJECT NO.

FIELD ACTIVITY SUBJECT:

DESCRIPTION ON DAILY ACTIVITIES AND EVENTS:

VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE

(FIELD ENGINEER) DATE

FIGURE 18

SAMPLE LABEL

IT

Project Name ____________________ Project No. __________

Sample Location ______________________________________

Boring/Well No. ______________________________________

Collector's Name ____________________ Date __________

Sample Type: ____Ground Water ____Surface Water

____Soil ____Sludge/Waste

Parameters ______________ Preservative ______________

Bottle ________ of ________ ____Filtered ____Nonfiltered

FIGURE 19

INTERNATIONAL TECHNOLOGY CORPORATION

DATE						
TIME						
PAGE ____ OF ____						
PAGE						
PROJECT NO.						

SAMPLE COLLECTION LOG

PROJECT NAME ______________________________

SAMPLE NO. ______________________________

SAMPLE LOCATION ______________________________

SAMPLE TYPE ______________________________

COMPOSITE ______ YES ______ NO

COMPOSITE TYPE ______________________________

DEPTH OF SAMPLE ______________________________

WEATHER ______________________________

CONTAINERS USED	AMOUNT COLLECTED

COMMENTS:

PREPARED BY: ______________________________

INTERNATIONAL TECHNOLOGY CORPORATION

FIGURE 20

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER:	PROJECT NAME:	
BORING NUMBER:	COORDINATES:	DATE:
ELEVATION:	GWL: Depth Date/Time	DATE STARTED:
ENGINEER/GEOLOGIST:	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS:		PAGE OF

DEPTH ( )	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ( )	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS

NOTES:

FIGURE 21

IT CORPORATION

RESPIRATORY TRAINING COMPLETION FORM

▶INITIAL ONLY THE APPROPRIATE BLOCKS◀

Name ______ Please Print Date ______	SCBA			Airline Pressure Demand	Cartridge Fullface	Cartridge Halfmask	OTHER SCBA	Other air purifying respirators
	IIA	2.2	Egress					
1. I understand why respiratory protection is needed and where and when it should be used.								
2. I know how to use this respirator properly.								
3. I know how to clean and inspect this respirator.								
4. I understand the limitations and restrictions of the respirators I will be using.								
5. I wore this respiratory equipment in normal air and checked the facepiece fit.								
6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means.								
7. I understand that a good gas tight face seal cannot be achieved with obstruction such as facial hair or glasses (with fullface mask).								

SIGNATURE ______

ITC FORM 9561 (9 84) DIVISION ______ LOCATION ______ JOB TITLE ______

FIGURE 22

TAILGATE SAFETY MEETING

Division/Subsidiary ______________________ Facility ______________________

Date ____________ Time ____________ Job Number ____________

Customer ______________________ Address: ______________________

Specific Location ____

Type of Work ____

Chemicals Used ____

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment ____

____

Chemical Hazards ____

____

Physical Hazards ____

____

nergency Procedures ____

____

Hospital / Clinic ______________ Phone (   ) ______________ Paramedic Phone (   ) ______________

Hospital Address ____

Special Equipment ____

____

Other ____

ATTENDEES

NAME PRINTED	SIGNATURE

Meeting conducted by ______________________ ______________________

NAME PRINTED SIGNATURE

SUPERVISOR ______________________ MANAGER ______________________

FIGURE 23

Physical Activity Restriction

EMPLOYEE'S NAME ______________________ DATE ______________

DIVISION ______________________ LOCATION ______________

DATE OF INJURY/EXAM ______________________ JOB TITLE ______________

Employee is subject to the following physical activity restriction(s):

____

____

____

____

____

____

____

☐ Acceptable for work under restriction stated above	By ______________
☐ Not acceptable for work under restriction stated above	Date ______________

____
Employee Date

____
Manager Date

____
Health & Safety Date

Distribution: Health & Safety
Administration Manager

ITC Form 9410-1
(Rev. 1/85)

INTERNATIONAL TECHNOLOGY CORPORATION

FIGURE 24

SUPERVISOR'S EMPLOYEE INJURY REPORT

This is an official document to be initiated by the employee's supervisor. Please answer all questions completely. This report must be forwarded to the employee's Regional Health and Safety office within 24 hours of the injury.

Injured's Name ____________ Sex ____ S.S. No ____________ Birthdate ____________

Home Address ____________ City ____________ State ______ Zip ______ Phone ____________

Job title ____________ Employee's P.C ______ Hire date ______ Hourly wage ______

SUPERVISOR

Date of incident ____________ Time ______ Time reported ______ To whom? ____________

Client name ____________ Client address ____________ Time shift began ______

Exact location of incident ____________ Did employee leave work? ☐ No ☐ Yes When ______

Has employee returned to work? ☐ No ☐ Yes When ______ Did employee miss a regularly scheduled shift? ☐ No ☐ Ye

Doctor/Hospital name ____________ Address ____________

Witness name(s) ____________ Statements attached? ☐ No ☐ Ye

Nature of injury ____________ Exact body part ____________

Medical attention: ☐ None ☐ First aid on site ☐ Doctor's office ☐ Hospital ER ☐ Hospitalize

Job assignment at time of incident ____________ Job: ______ Phase: ______ Task: ______ Subtask: ______

Describe incident ____________

What unsafe physical condition or unsafe act caused the incident? ____________

What corrective action has been taken to prevent recurrence? ____________

Supervisor/Foreman ____________ (Print) ____________ Signature ____________ Date

MANAGER

Comments on incident and corrective action ____________

Manager's name ____________ (Print) ____________ Signature ____________ Date

HEALTH AND SAFETY

Concur with action taken? ☐ No ☐ Yes . Remarks ____________

OSHA Classification:

☐ Incident only ☐ First aid ☐ No lost workdays ☐ Lost workdays ☐ Restricted activity ☐ Fatal

Days away from work ______ Days restricted work ______ Total days charged ______

☐ State jurisdiction ☐ Federal L&H ☐ Date ER submitted ______ Which claims office ______

Coding: A. Injury type or illness ______ B. Injured body parts ______ C. Activity at time of accident ______ D. Injury cause code ______

E. Agent code ______ F. Safety rule violated code ______ G. Accident prevention code ______

Name ____________ (Print) ____________ Signature ____________ Date

ITC FORM 9300.1-1 (07/86)
Refer to ITC PRO 9300.1 for reporting procedures

White: Corporate Health and Safety Yellow: Regional Health and Safety Pink: Profit/Cost Center

INTERNATIONAL TECHNOLOGY CORPORATION

FIGURE 25

REAL TIME AIR MONITORING LOG

PROJECT NAME ______________ LOCATION ______________ PROJECT NO. ______________

Date	Analyst	Time	Instrument (Mfg/Model/ Serial No.)	Calibration Date & Cpd.	Compound Measured	Span Set or Sens. Cal.	Conc. (Units)	Location/Activity/Comments